



HAMPDEN COUNTY REGISTRY OF DEEDS

DAMS FILE COLLECTION

BOOK D13

TOWN OF MONSON, MASSACHUSETTS



*Donald E. Ashe, Register
Hampden County Registry of Deeds,
a Division of the Office of
William Francis Galvin, Secretary of the Commonwealth*

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1933 Monson

Dam located on Chicopee Brook.

| | |
|-----------|---|
| City/Town | Monson |
| Dam | Ellis Mills Dam |
| Dam | Sun-Up Lamp Works Dam |
| Name | Sun-Up Lamp Works |
| Name | A D Ellis Mills Incorporated/Woolen Manufacturers |
| Water | Chicopee Brook |

Page 42 of report

A. E. Ellis & Sons,
Monson, Mass.

you are notified that your
upstream #1 dam, located on Chudpu Brook as called
in the Town of Monson, etc.

"The structure is in good condition
with the exception of the joints of the
masonry which requires pointing."

April 28, 1926

A. D. Ellis & Sons,
Monson, Mass.

Gentlemen:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your upper or #1 dam, located on Chicopee Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The structure is in good condition with the exception of the joints of the masonry which requires pointing."

Yours very truly,

COUNTY COMMISSIONERS

Chairman

April 26, 1933

Sun-Up Lamp Works,
92 Liberty Street,
New York, N. Y.

Mr. H. A. Brinkerhoff, Pres.,

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Chicopee Brook so called, in the Town of Monson, Mass. has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"A few of the top stones on the spillway crest are loose and require re-setting. There is a growth of weeds, sedge, etc., along the east end of the spillway, which lessens its discharging capacity. These weeds, etc. should be cut down and removed."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

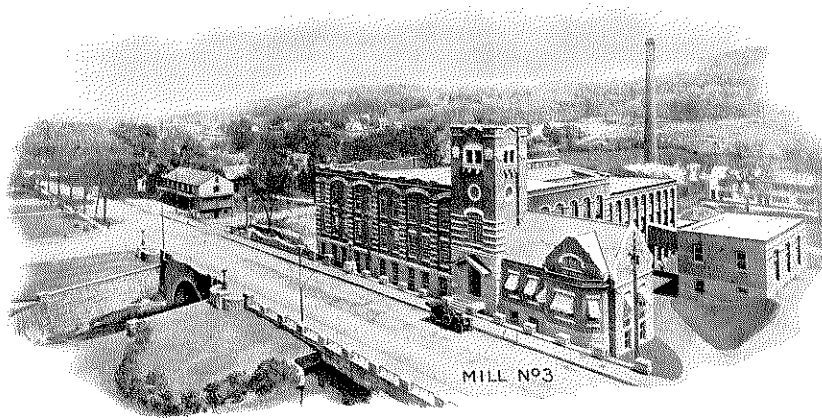
COUNTY COMMISSIONERS

By _____
Chairman.

DWIGHT W. ELLIS
PRESIDENT & TREASURER

GEORGE W. ELLIS
VICE PRES. & ASST. TREAS.

FRANK J. ENTWISTLE
SECRETARY



FANCY OVERCOATINGS
BROAD CLOTHS
CASKET CLOTHS
BILLIARD CLOTHS
CHINCHILLAS
KERSEYS
AUTOMOBILE CLOTHS
UNIFORM CLOTHS
TENNIS BALL CLOTHS
GAITER CLOTHS

A.D. ELLIS MILLS INCORPORATED

ESTABLISHED 1870 INCORPORATED 1924

WOOLEN MANUFACTURERS
MONSON, MASS.

May 4th, 1926.

County of Hampden,
Office of the County Commissioners,
Springfield, Mass.

Gentlemen:-

We beg to acknowledge receipt of
your communication of April 28th, relative
to our #1 dam, located on Chicopee Brook.

In reply would state that at the
time of low water, this summer, we will attend
to this matter.

Very truly yours,

A.D. ELLIS MILLS INCORPORATED.

DWE/K

per *D. W. Ellis*

SUNUP LAMP WORKS, INC.

A SUBSIDIARY OF
THE NEW ENGLAND ELECTRIC CO., INC.

92 LIBERTY STREET
NEW YORK

NEW ADDRESS:
37 WALKER STREET
CANAL 7-1579

MANUFACTURERS OF
INCANDESCENT LAMPS
FACTORY: MONSON, MASS.
RECTOR 2-4365

April 27, 1933

County of Hampden
Office of County Commissioners
Springfield, Mass.

In answer to your letter of April 26th regarding the
dam at Monson.

We intend during the summer months to drain this basin,
clean it out, kill the vegetation in the water, and put it
in a more presentable form.

To do this, we are going to have to dry the pond, and
if it is satisfactory to yourself, we will arrange to have
the weeds and sedge cut along the spillway within the next
two or three weeks, providing we can drain the pond and do
the general work within that time.

Please note that our address has been changed to 37
Walker Street, New York City.

SUNUP LAMP WORKS, INC.


H. A. Brinkerhoff

HAB hl

November 3, 1937

A. D. Ellis Mills, Inc.
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby notified that your dam on Chicopee Brook in Monson (the former Sun-Up Lamp Works dam) has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"The horizontal wood plank apron of this dam is in poor condition and should be either substantially repaired or renewed; likewise, the south channel wall is in need of some repairs. It is recommended that the attention of the owner be drawn to the need of these repairs, if the pond is to be maintained.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

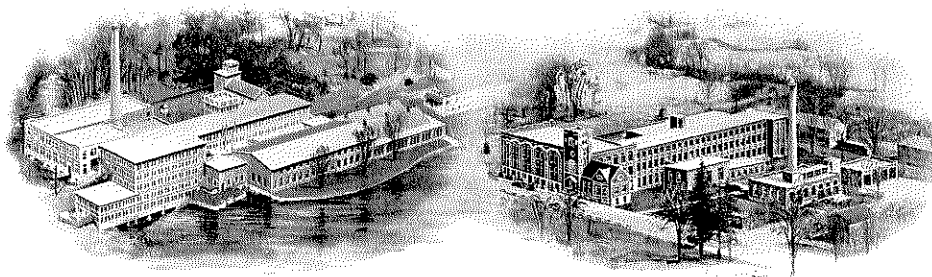
COUNTY COMMISSIONERS

By _____ Chairman

DWIGHT W. ELLIS
PRESIDENT & TREASURER

GEORGE W. ELLIS
VICE PRES. & ASST. TREAS.

FRANK J. ENTWISTLE
SECRETARY



FANCY OVERCOATINGS
BROAD CLOTHS
CASKET CLOTHS
BILLIARD CLOTHS
CHINCHILLAS
KERSEYS
AUTOMOBILE CLOTHS
UNIFORM CLOTHS
TENNIS BALL CLOTHS
GAITER CLOTHS

A.D. ELLIS MILLS INCORPORATED

ESTABLISHED 1870 INCORPORATED 1923

WOOLEN MANUFACTURERS

MONSON, MASS.

November 4, 1937

Office of the County Commissioners
Springfield
Massachusetts

Attention Mr. Thomas J. Costello, Chairman

Gentlemen:

We beg to acknowledge receipt of your communication of November 3 in reference to the dam on the Chicopee Brook in Monson (the former Sun-Up Lamp Works dam) in which your engineer makes certain recommendations.

As you may know, we maintain this property entirely as a store-house and do not intend to carry on any manufacturing purposes, so that the pond is of no benefit to us. Consequently we would have no reason to maintain it.

We would, therefore, appreciate your advising us further in regard to this matter.

Yours truly,

A. D. ELLIS MILLS INCORPORATED

President & Treasurer

DWE/B

Copy of this letter sent to
James L. Tighe, Engineer, on
November 10, 1937.

November 24, 1937

A. D. Ellis Mills Inc.
Monson, Mass.

Gentlemen:

In answer to your letter of the 4th inst. relative to your dam on Chicopee Brook in Monson, formerly the property of the Sun-Up Lamp Works, we wish to state that if this structure is not going to be kept in repair and in a safe condition, it will be necessary, in order to comply with the requirements of the statutes, to have no pondage formed thereby, so that there will be no danger to life and property down stream in case of failure of the structure in flood flow or high water.

To prevent such a danger and have a free water-way for the brook the dam could be breached or its top lowered in the manner discussed by our engineer and your representative a few days ago at your office.

Yours truly

COUNTY COMMISSIONERS

Chairman

September 20, 1950

A. D. Ellis Mills, Inc.
288 Main Street
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"There is a small leak, or discharge, from the base of the dam at the westerly end. This water may be water from the spillway running back into the stone of the spillway and then emerging at the base of the dam. The source of this apparent leakage should be investigated."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

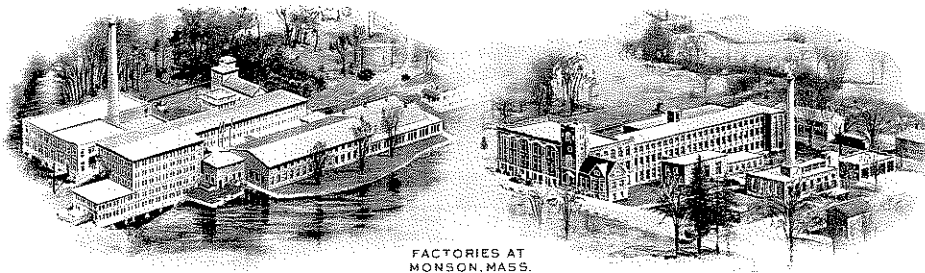
COUNTY COMMISSIONERS

By _____

Chairman

*Ellis Mills Upper Dam
Monson*

FANCY OVERCOATINGS
BROAD CLOTHS
CASKET CLOTHS
BILLIARD CLOTHS
CHINCHILLAS



FACTORIES AT
MONSON, MASS.

KERSEYS
AUTOMOBILE CLOTHS
UNIFORM CLOTHS
TENNIS BALL CLOTHS
GAITER CLOTHS

A.D. ELLIS MILLS INCORPORATED

ESTABLISHED 1863 INCORPORATED 1923

WOOLEN MANUFACTURERS
MONSON, MASS.

September 26, 1950

Office of County Commissioners
County of Hampden
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Replying to your letter of September 20 drawing our attention to a leak at the base of our dam, would say that this matter will have our immediate attention.

Sincerely yours,

A. D. ELLIS MILLS INCORPORATED

DWE, JR./B

A. D. Ellis
Treasurer

By Invitation Member



*Emblem of
Business Character*
RICE LEADERS
OF THE WORLD
ASSOCIATION
*Represents High Standing in
Name-Product Policy*

Copy of this letter mailed to G.H. McDonnell,
County Hydraulic Engineer, on September 28, 1950.

Gaudreau Dam



1950 Monson

Also See: Dam Report Section - Monson.

| | |
|-----------|---------------|
| City/Town | Monson |
| Dam | Gaudreau Dam |
| Name | Gaudreau, A E |

September 20, 1950

A. E. Gaudreau
520 Roosevelt Avenue
Springfield, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"The swale spillway on the southerly end of the dam has been bridged, and two 18-inch corrugated iron culvert pipes installed. These culvert pipes greatly restrict the capacity of the swale spillway. The full cross-sectional area of the spillway channel should be maintained. The culvert should be removed and replaced with a bridge, or a new swale spillway provided."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman

JAMES L. TIGHE
PHILIP E. BOND

TELEPHONE
HOLYOKE 5525

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
WATER POWER
DAMS

October 2, 1950

The Hon. The Board of County Commissioners
Hampden County Court House
Springfield, Massachusetts

Gentlemen:

Enclosed find a corrected copy of the
letter to Mr. A. E. Gaudreau, pertaining to the
inspection of his dam located in Monson.

Mr. Gaudreau's address is now Springfield,
and has been changed accordingly.

Very truly yours,

By


G. H. McDonnell

County Hydraulic Engineer

Brown Dam



o Monson

Also See: Dam Report Section - Monson. Also see: Schimmel Dam fka Brown Dam.

| | |
|-----------|------------|
| City/Town | Monson |
| Dam | Brown Dam |
| Name | Brown, E L |

MONSON
D13003

BROWN DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Aldrich Dam



1960 Monson

Small dam on westerly side of Stafford Road, Route 32, just southerly of Crow Hill Road.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Aldrich Dam |
| Name | Aldrich |
| Name | Goodspeed, Bertha |
| Streets | Crow Hill Road |
| Streets | Stafford Road |
| Streets | Route 32 |

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
Nov. 17, 1960

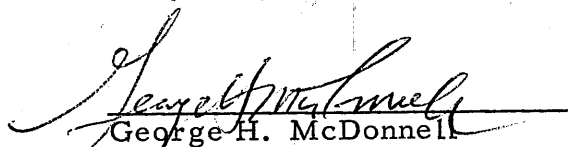
The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm St.
Springfield, Mass.

Gentlemen:

Reference is made to the communication of Oct. 31, 1960, from the Commonwealth of Massachusetts, Dept. of Public Works, relative to needed repairs to the headwall at the conduit in the small dam on the westerly side of Stafford Rd., Rte. 32, just south of Crow Hill Rd. in Monson. This is the dam formerly owned by Aldrich and now the property of Bertha Goodspeed.

The necessary work of maintenance at the spillway inlet is apparently going to be done by the Public Works Dept. of the Commonwealth. Though the letter of Oct. 31, 1960, points out that maintenance of the dam cannot be assumed by the Dept. of Public Works, the condition of the headwall at the culvert will be corrected. This is the work that was recommended, and consequently the needed maintenance will actually be done.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/f



Commonwealth of Massachusetts

COPY

Office of the
County Commissioners
52 State Street

County of Hampden

William F. Stapleton
Chairman

Ralph P. Walsh
Lloyd M. Fradet

Springfield, Mass.

October 16, 1968

Board of Selectmen
Town Office
Town of Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that the County Hydraulic Engineer has recently inspected the small dam situated westerly of Stafford Road and southerly of Crow Hill Road. This small dam is carried in County records as the Aldrich Dam and the owner of the property appears to be Goodspeed, as of 1960.

The relatively small amount of water ponded by the dam and the roadway fill carrying Stafford Road, Highway Route 32 across the brook just downstream of the dam, prevents the stored water from being a possible menace to the safety of persons and to property located downstream. However, directly below the small spillway of the dam and actually being a part of the spillway, is the entrance to the highway culvert. The wingwalls at the culvert entrance are badly eroded and other work should be done at this location. The report of the County Hydraulic Engineer is self-explanatory and is as follows:

"This small stone masonry structure, backed up with earth, leaks somewhat and leakage is sufficient to result in the pond being kept down to a level of about 12" below the spillway crest. Water seeps and flows through the earth fill back of the masonry wall and emerges through the wall from the downstream face at the toe of the wall. Brush and trees grow from the face of the wall and these will eventually cause leakage through the wall.

COPY

The wingwalls of the concrete culvert under the roadway just downstream of the small dam are badly eroded, are being undermined and are failing. This condition has been noted for some time in the past and has been reported by your Honorable Board to the Town of Monson. Water from the dam, after passing over the spillway, passes under Route 32 through the highway culvert. Though the wingwalls and culvert are indirectly a part of the dam structure in that they provide facilities for carrying the overflow away from the dam and under the highway, the wingwalls are not directly a part of the dam and are actually public property.

It would be advisable for either the Town or the Mass. Department of Public Works to do the necessary maintenance work at the spillway of this small dam so as to protect the culvert and the culvert inlet passing under the highway. Also, brush and small tree growth occurring from the stone masonry at the dam should be cut down and future regrowth discouraged."

The report is sent to you for whatever action you wish to take. If maintenance work at this culvert and culvert inlet is under the jurisdiction of the Mass. Department of Public Works, then it is recommended that you take whatever steps are necessary to inform that Department of the desirable maintenance and repair work.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

C
O
P
Y

C
O
P
Y

December 4, 1968

MONSON
ROUTE 32
Aldrich Dam Culvert

Board of Selectmen
Town of Monson
Memorial Town Hall
Monson, Massachusetts

Gentlemen:

In reply to your letter of November 12, 1968 with the attached report on the condition of the highway culvert at Aldrich Dam on Route 32 Monson, please be advised of the following:

An engineer from this office inspected the reported damage to the headwall and concurs with the report of the Hampden County Hydraulic Engineer. As soon as possible, repairs will be made by rebuilding the wall by placing burlap bags filled with cement concrete. This method will result in a rip rap type of protection to the face of the wall and under the pipe and should thereby insure the stability of the headwall in the future. It seems to me steps should be taken to repair this dam.

Very truly yours,

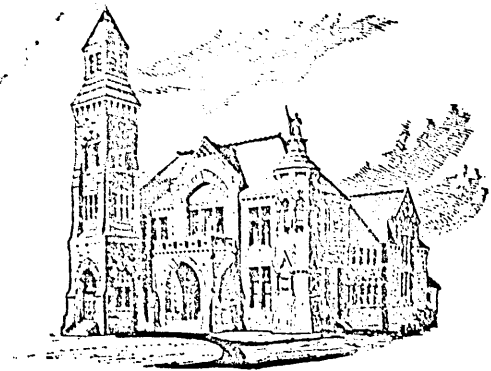
s/ F.W.Guerin
District Highway Engineer

FWM/rd
C - FWM
TBF
JF

RECEIVED

JAN 15 1969

TIGHE & BOND, INC.



SELECTMEN and BOARD of HEALTH

Memorial Town Hall



Monson, Massachusetts

January 13, 1969

Mr. George H. McDonnell
Hydraulic Engineer
Hampden County Office
Springfield, Massachusetts

Dear Mr. McDonnell:

Relative to conversation with Mr. Bradway at a special Town Meeting regarding Aldrich Dam on Stafford Road, please note that a copy of the report received by the Selectmen was forwarded to the Worcester office of the Department of Public Works.

We are enclosing copy of letter received from Mr. F.W. Guerin of the Worcester office. The last sentence leads us to believe that the dam does not come under their jurisdiction.

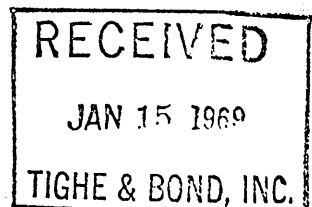
Would you kindly take this matter up with the Department of Public Works.

Sincerely,

BOARD OF SELECTMEN

Enc.
oeb:l

Omer E. Bradway
Omer E. Bradway, Chairman



GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

C O N S U L T I N G E N G I N E E R S

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
January 21, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Re: Aldrich Dam
Monson, Mass.

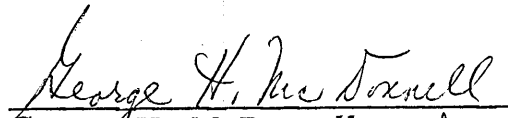
Gentlemen:

Reference is made to the above subject dam and to my letter-report recommending certain repair work at the spillway facility. Your Board wrote to the Selectmen of Monson on October 16, 1968 recommending certain maintenance work, particularly at the spillway.

As a result of your communication to the Selectmen, the District Highway Engineer was notified and he has indicated that the recommended repair work will be done at the culvert and spillway wing walls.

I am enclosing a photocopy of the letter from the Board of Selectmen dated January 13, 1969, and a copy of the letter from the District Highway Engineer to the Selectmen dated December 4, 1968. I am also enclosing a copy of my letter to the Selectmen of Monson advising them that in my opinion, there is no further action for them to take at this time.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/amd
Encl.

CD Monson
January 21, 1969

Board of Selectmen
Town Office Building
Monson, Massachusetts

Gentlemen:

I have received your communication of January 13, 1969 regarding the letter from the District Highway Engineer of the Commonwealth of Massachusetts relative to the Aldrich Dam and related spillway culvert under the State Highway.

I note that the State Department of Public Works will make repairs to the culvert inlet and related wing walls by placing burlap bags filled with cement concrete to result in a riprap type of protection at and under the culvert pipe inlet. The District Highway Engineer is of the opinion that this work will protect the highway culvert and insure the stability of the head wall in the future.

The District Highway Engineer indicates that some steps should be taken to repair the dam itself.

The work as planned by the Department of Public Works is the most pressing work needed at the present time. The undersigned will inspect the dam again in the spring of this year to examine any work done by the State and, at that time, will determine what further repairs if any, are desirable. At the present time, the highway itself is in reality the dam, though there is an embankment adjacent to the highway which contains the small spillway and directly retains the water.

In my opinion, you have taken all steps necessary at this time to improve conditions and protect the public roadway.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/amd

cc - Board of County Commissioners ✓

Anderson Dam



1948 Monson

Dam located adjacent to Anderson home on small tributary of Chicopee Brook.

| | |
|-----------|---------------------|
| City/Town | Monson |
| Dam | Anderson Dam |
| Name | Anderson, William H |
| Water | Chicopee Brook |

COPY

November 10, 1948

Mr. William H. Anderson
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on a tributary of Chicopee Brook in the Town of Monson has been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"In a recent inspection made of the earthen dam located on a tributary of Chicopee Brook in the Town of Monson and owned by William H. Anderson, there were found muskrat burrows running through the dam causing leaks that endanger the structure. The burrows should be sealed up immediately to prevent failure of the dam."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By William Dwight

Chairman

Thomas F. Sullivan

September 20, 1950

Attorney, W. H. Anderson
184 Main Street
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"The swale spillway on the end of the dam nearest the house, has been eliminated. A new swale spillway appears to have been cleared on the southerly end of the dam. The crest of this new swale should be lowered to provide adequate freeboard on the dam."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

November 14, 1951

Attorney W. H. Anderson
184 Main Street
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"A hole was noted in the fill of the dam adjacent to the spillway. This hole seems to have been washed. It should be investigated and packed with tamped gravel. Stop planks in the spillway are too high and should be removed to allow for a 24-inch freeboard in the spillway until a proper swale spillway is provided."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

December 3, 1952

Attorney W.H. Anderson
184 Main Street
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"The swale spillway on the left end of the dam has not been constructed. There is a leak thru the dam at the right of the spillway structure. Water can be seen entering the dam at a sunken spot in the earth fill and emerging thru the side of the spillway channel just below the dam. This hole should be cleaned out and plugged with tight gravel from the upstream side."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman

Anderson Dam, Monson

William Anderson
Monson, Mass

12/17/52

Called to stat he would do repairs
requested to his dam - in the spring

Typewritten Memo of above message sent to Mr. McDonnell on
Dec. 18, 1952.

TIGHE & BOND

December 31, 1952

Attorney William Anderson
184 Main Street
Monson, Mass.

COPY

Dear Sir:

In reference to your recent call to the County Commissioners' office on the needed repairs to your dam, it would be satisfactory to delay the construction of the swale spillway until 1953 provided you make the spillway opening under the bridge as large as possible by the lowering of the crest thru the removal of the top stop planks. This will lower the pond a little but will provide greater safety during winter and spring run-off and at the same time will undoubtedly lower the water level enough to prevent water from entering the leak. This leak could be temporarily plugged by the use of a few shovels full of tight gravel tamped into the hole with a tamping rod.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

COPY

Anderson Dam Monson

January 6, 1954

Atty W. H. Anderson
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located adjacent to your home in Monson has been recently inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him:

The construction of a swale spillways to be located on natural ground at the left end of the dam is still advisable and recommended. The construction of this trough type of spillway would not be too costly and would provide a safety device to guarantee that the main spillway would never be overloaded nor the dam topped by extreme runoff flows. Leakage as reported previously has been repaired by the owner.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,
COUNTY COMMISSIONERS

By _____
Chairman

Oct. 22, 1958

Attorney William H. Anderson
144 Main Street
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson adjacent to your home was recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The downstream end of the concrete and stone masonry spillway is being undermined. This condition should be corrected immediately.

A swale spillway has been constructed at the left end of the dam. This spillway is approximately 9 ft. wide. The construction of this spillway and its proper maintenance will aid in passing storm flows."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Oct. 5, 1960

Atty. Wm. H. Anderson
144 Main Street
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located adjacent to your home in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The embankment of this dam was found to be in a satisfactory condition. The masonry spillway, as well as the swale overflow spillway to the left of the dam embankment, are both in good condition. The largest of the pine trees growing from the earth embankment of the dam should be cut down. Root structure of this tree now extends across the embankment and if the tree be uprooted in a heavy wind storm, the cavity thus formed might be sufficiently large in cross sectional area and sufficiently deep to result in the release of stored water that could wash a breach thru the dam. Large trees growing from narrow earth embankments are not desirable because of the added danger they present."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Nicolet Dam

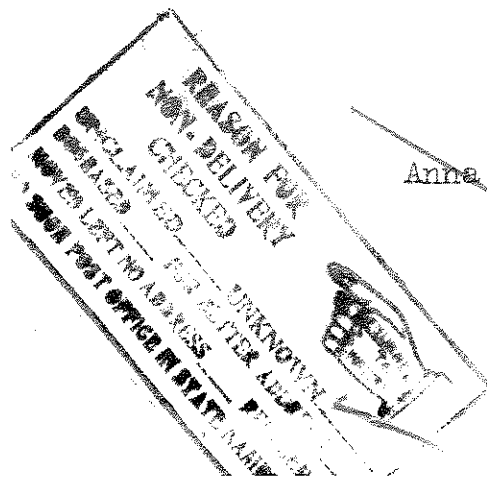


1926 Monson

Dam located on Calkins Brook.

| | |
|-----------|-----------------|
| City/Town | Monson |
| Dam | Nicolet Dam |
| Name | Nicolet, Anna D |
| Water | Calkins Brook |

After 5 days, return to
COUNTY COMMISSIONERS,
Court House,
SPRINGFIELD, MASS.



Anna D. Nicolet,
Monson,
Mass.

Not for R. D. No.

After 5 days, return to
COUNTY COMMISSIONERS,
Court House,
SPRINGFIELD, MASS.



Not at the Hospital.

~~Anna D. Nicolet,~~

~~Palmer,~~

~~Mass.~~

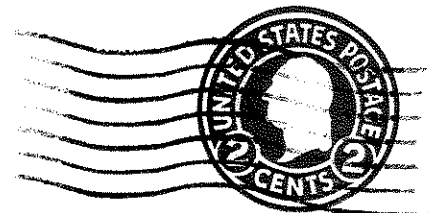
Not for Carrier No. 1-2-3

Not for R. D. No. 1-2-3

PERSON FOR
DELIVERY
CHECKED
UNCLAIMED
DECEASED
MOVED LEFT NO ADDRESS
POST OFFICE

FOR BETTER
UNCL
1928

After 5 days, return to
COUNTY COMMISSIONERS,
Court House,
SPRINGFIELD, MASS.



Anna D. Nicolet,

R.F.D. Ludlow,
Mass.

UNCLAIMED

Page 48 of report

Anna. D. Nicolet,
Monson, Mass.

you are notified that your
dam, located on Calhoun Brook as called in the
Town of Monson, etc.

" The spillway is a sluice gate connected
with the mouth of the culvert five feet wide and
seven feet deep laid through the south end of the dam.
In time of flood flow, this gate has to be opened to
increase the discharge from the pond and prevent
water from topping the dam.

An arrangement of this kind is a very poor
one, and it is recommended that a surface overflow
of sufficient size be added to the south end of
the dam.

Now, therefore, etc.

February 24, 1928

Anna D. Nicolet,
Monson, Mass.

Dear Madam:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Calkins Brook, so-called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The spillway is a sluice gate connected with the mouth of the culvert five feet wide and seven feet deep laid through the south end of the dam. In time of flood flow, this gate has to be opened to increase the discharge from the pond and prevent water from topping the dam.

An arrangement of this kind is a very poor one, and it is recommended that a surface overflow of sufficient size be added to the south end of the dam."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Lunden Dam



1961 Monson

Dam located off Butler Street in Monson.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Lunden Dam |
| Name | Lunden, C. Walter |
| Streets | Butler Street |

C-D

November 18, 1955

COPY

Mr. C. Walter Lunden
Butler Road
Monson, Mass.

Dear Sir:

This will confirm our telephone conversation of this past week in reference to repair to your dam located off of Butler Road in Monson. It is your intention to close the breach washed through the dam in order to repair the road that is carried by the dam. In repairing this breach, you plan to install a culvert pipe in the washout so that the dam will not pond water other than the water now naturally held back in the basin.

Since the work that is contemplated is the reconstruction of the washed out area for the purpose of roadway use and not for the purpose of impounding water, the work that you plan would not be considered as dam construction. If at any time you intend to block off the culvert and reconstruct a spillway and thus consequently pond water, it would then be necessary to prepare plans and specifications of the proposed construction and to file these with the County of Hampden for approval and record purposes.

If the undersigned can be of further assistance to you, please do not hesitate to call or write this office.

Very truly yours,

GEM/cmm

George H. McDonnell
County Hydraulic Engineer

COPY

CD Monson
Oct. 11, 1961

Mr. C. Walter Lunden
Butler Road
Monson, Mass.

Dear Sir:

Reference is made to my visit at the site of your dam in Monson and the routine inspection of the structure for completing my report to the County Commissioners of Hampden County.

On Friday, Oct. 6, 1961, I met with you at the site of your dam and pond and in your presence inspected a small swampy area near the upper end of your pond, for the purpose of determining whether or not you have the right to construct a small dam at the outlet of the swamp, in order to raise the level of the swamp water about a foot, more or less.

The construction contemplated will result in a small earth embankment less than 4 ft. in total height and the area of water impounded will be somewhat less than one acre. The depth of water in the vicinity of the small embankment will probably equal 3 ft., more or less. However, fifty percent of the swamp area will apparently have a water depth shallower than 2 ft. and a fairly large area of the water impounded will have a depth of only about 1 ft.

As a result of the above estimated water depths and areas involved, it is my opinion that the quantity of water to be impounded by the small earth embankment will be somewhat less than one million gallons. The drainage area involved is quite small and consequently, the construction as contemplated does not come under Chapt. 253 of the General Laws of the Commonwealth of Massachusetts. The construction as planned is not 10 ft. high or higher, it will not impound a million gallons or more and the drainage area contributing to the swamp is not one square mile or greater.

2.

CD Monsen
Oct. 11, 1961

Insofar as the requirements of the Law pertaining to dams, under Chapt. 253 are concerned, you may construct the planned embankment without the need for filing plans and specifications with the County of Hampden.

I wish to point out, however, that should the impounding of the additional water in the swamp back water beyond the limit of your property, you may be faced with a problem depending upon the attitude of your neighbor. In this regard, any problem that occurs would be a civil problem and would not come under the jurisdiction of Hampden County.

Very truly yours

GHM/cmb
cc: Bd County Comms

George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
Oct. 11, 1961

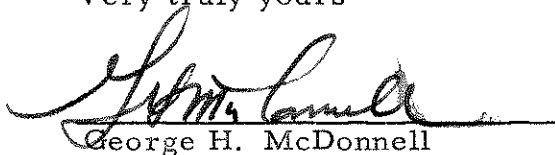
The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Enclosed for your information and file purposes please find a copy of a communication sent to Mr. Lunden of Monson regarding the inspection of a small swampy area adjacent to his pond. The contents of my letter to Mr. Lunden are self explanatory.

I felt that you should have a copy of this letter in your files in case any person questions the work as planned by Mr. Lunden at his pond.

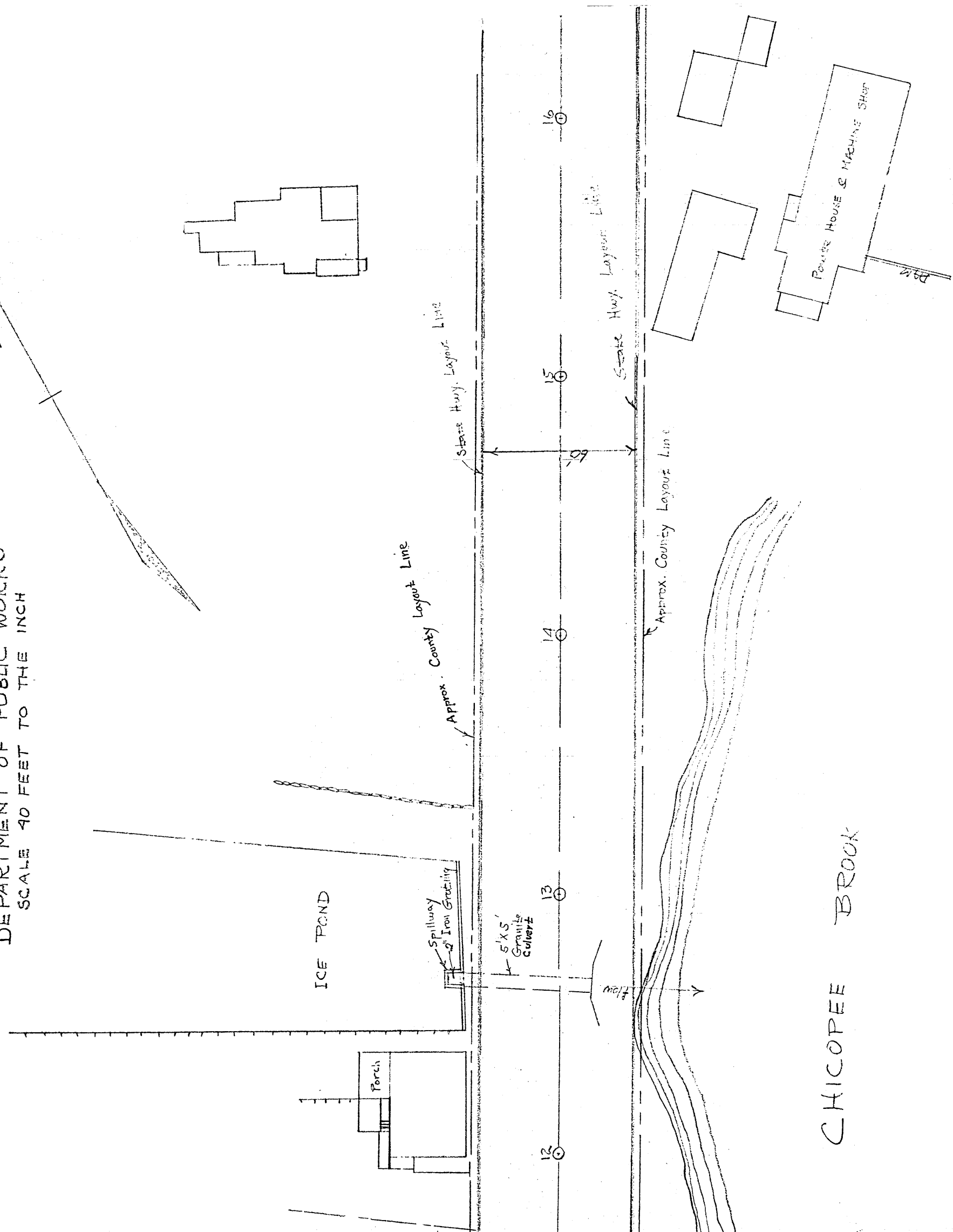
Very truly yours



George H. McDonnell
County Hydraulic Engineer

GHM/cmb
enc.

PLAN OF ROAD
IN THE TOWN OF
MONSON
LAID OUT AS A STATE HIGHWAY BY THE
DEPARTMENT OF PUBLIC WORKS
SCALE 40 FEET TO THE INCH



Church Manufacturing Company Dam



1944 Monson

Dam located on Chicopee Brook.

| | |
|-----------|--------------------------------------|
| City/Town | Monson |
| Dam | Church Manufacturing Company Dam |
| Name | Church Manufacturing Company |
| Name | American Standard Plumbing & Heating |
| Name | C.F. Church Manufacturing Company |
| Water | Chicopee Brook |

C.F. CHURCH MANUFACTURING CO.

Church Seats

"THE BEST SEAT IN THE HOUSE"

TOILET SEATS
MOLDED PLASTIC PRODUCTS

HOLYOKE, MASS.
MONSON, MASS
BRATTLEBORO, VT

MAIN OFFICE
HOLYOKE, MASSACHUSETTS

Molding Division,
Monson, Mass.
May 3, 1944.

Mr. T. Costello,
County Commissioner's Office,
Court House,
Springfield, Mass.

Dear Mr. Costello,

In line with our conversation of this morning,
we want to do some grading at the Monson Plant which will
require some of the gravel to be pushed into the pond.

We would appreciate your sending your hydraulic
engineer to check this proposition, and advise us just what
can be done, or if there are any restrictions regarding it.

Please have your engineer telephone before coming
out as the writer wants to be sure and be there to see him.

Will appreciate getting this information at your
earliest convenience.

Very truly yours,

C. F. CHURCH MFG. CO.

S. L. Young
S. L. Young,
Manager, Molding Division

SLY/DS

Copy of this letter sent to Mr. Tighe
on May 5, 1944.

CHURCH

May 8, 1944

S. L. Young, Manager,
Molding Division,
C.F.Church Manufacturing Co.,
Monson, Mass.

Dear Sir:

In response to your letter of
May 3rd, this is to notify you that Mr. James L.
Tighe, our Hydraulic Engineer, will be on your
premises on Thursday, May 11th next, between 4 and
5 p.m. to meet you and to go over the matter con-
tained in your letter.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman.

C/N

MEMBER
AM. SOC. C. E.
INST. C. E. GREAT BRITAIN
ENG. INST. OF CANADA

JAMES L. TIGHE

CONSULTING ENGINEER
CALEDONIAN BUILDING, 189 HIGH STREET

HOLYOKE, MASS.

TELEPHONE 5525

MEMBER AM. INST. OF CONSULTING ENGINEERS, INC.

MEMBER
BOSTON SOC. C. E.
ENG. SOC. WEST. MASS.
AM. & N. E. W. W. ASSOC'S

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
ANALYSIS OF WATER

May 16, 1944

WATER POWER INVESTIGATIONS
AND DEVELOPMENT
DAMS AND POWER INSTALLATIONS
ESTIMATES AND APPRAISALS

The Hon. The Board of County Commissioners
Hampden County
Court House
Springfield, Mass.

Dear Sir:

I have visited the Church Mfg. Co. in Monson on yesterday and was shown by the Manager, Mr. S. L. Young, the grading proposed to be done, as stated in his letter of May 3rd, inst. to you.

In the doing of the proposed work, some material to be excavated is to be deposited along and in the edge of the pond formed by the Church Mfg. dam. Inasmuch, as the county is only concerned about the safety of the dam, the depositing of material in the edge of the pond, especially at some distance away from the structure, will not affect the safety of the structure in any way, and, therefore, it seems to me, no action is required to be taken about the matter by the county.

Respectfully submitted,

James L. Tighe

May 17, 1944

S. L. Young, Manager,
Molding Division,
C.F. Church Manufacturing Co.,
Monson, Mass.

Dear Sir:

From the report of our Hydraulic Engineer, Mr. James L. Tighe, it appears that the work proposed to be done by you consists of depositing some excavated material along and in the edge of the pond formed by the Church Manufacturing Co., dam.

Inasmuch as the Board of County Commissioners is concerned only with the safety of the structure and inasmuch as no question of the same is being raised herein, it appears that no action is required to be taken in this matter by the Board of County Commissioners.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman.

TTM/N

C.F. CHURCH MANUFACTURING CO.

MANUFACTURERS OF

Church
sani  *Seats*
"Toilet Seats for Better Bathrooms"

OFFICES IN
PRINCIPAL CITIES

MAIN OFFICE
HOLYOKE, MASS.

FACTORIES
HOLYOKE, MASS.
MONSON, MASS.
BRATTLEBORO, VT.

HOLYOKE, MASSACHUSETTS

PLEASE REPLY TO
MOLDING DIVISION
MONSON, MASS.

May 9, 1944

Mr. Thomas J. Costello, Chairman
County Commissioners
Springfield, Massachusetts

Dear Sir:

We have your letter of May 8 regarding your
Mr. James L. Tighe, who plans to call on us
Thursday, May 11.

The writer is leaving today and will be out
of town for the balance of the week and we
would very much appreciate having your
engineer out here Monday, May 15 if it can
be conveniently arranged. I want to go over
this personally with him but it is impossible
any time during the balance of this week and
we trust you can arrange the meeting for next
week.

Thank you for your cooperation in this matter.

Yours very truly,

C. F. CHURCH MFG. CO.



S. L. Young
Manager - Molding Division

sly/mam
cc:Holyoke

Nº 142


Church
sani - *Seats*

C-D

September 14, 1955

COPY

C. F. Church Mfg. Co.
Monson
Mass.

Gentlemen:

From our field examination of dams within Hampden County, we find that certain damage was done to your dam at Chicopee Brook in Monson.

Before any repairs are made to this dam, plans and specifications of the proposed repairs should be filed with the County Commissioners. In planning repairs to your dam, consideration should be given to improving the structure whereby it will be capable of passing flood flows similar and even greater than the flow experienced in the recent flood.

Enclosed we are sending you a copy of Chapter 253 of the General Laws. The undersigned will be pleased to meet with you in regard to the repairs and alterations to your dam, if you so desire.

Very truly yours,

GHM*emm
enc.

By George H. McDonnell
County Hydraulic Engineer

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, INC.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Monson

Aug. 10, 1956

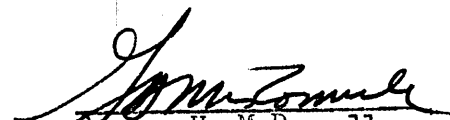
The Hon. the Board of County Commissioners
Hampden County Court House
Springfield, Mass.

Gentlemen:

Reference is made to plans and specifications submitted by the C. F. Church, Manufacturing Co. of Monson, Mass. regarding certain changes and alterations to their dam on Chicopee Brook in Monson. These plans and specifications were filed on August 3, 1956, and submitted to the undersigned for review and report.

I have conferred on these plans and specifications with the Designing Engineer and will withhold submission of my report pending receipt of additional sheets of plans by the Engineer.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mdb

Oct. 22, 1958

W. C. Moulton
Palmer Lower Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et. seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook upstream from the Church Manufacturing Co. Dam has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

" The drawoff pipe and the wheel pit are both open and no water is ponded behind the dam. Nearly all of the flows of the brook pass thru the open central drawoff pipe. The concrete masonry of the central portion of the dam itself is quite worn and eroded. This dam should not again pond water until the eroded portion is properly repaired. "

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Oct. 22, 1958

C. F. Church Manufacturing Co.
North Main Street
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam situated on Chicopee Brook adjacent to your Monson Plant has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Leakage was noted squirting thru the masonry wall at the west end of the dam just downstream from the drawdown gate. An examination of the soil between this abutment wall and the roadway indicates that the ground, downstream of the dam, is saturated with water to the level of the stored water back of the dam. Some of the soil is quite soft from being so saturated. It is doubtful if the abutment wall was constructed to retain full hydrostatic head. This condition of leakage around the west abutment should be investigated and proper action taken to help stop the leakage or to safely drain the soil to eliminate the hydrostatic head now existing behind this wall."

This condition described by the Engineer regarding the saturated soil behind this abutment wall should be investigated as soon as possible. The County Hydraulic Engineer will be pleased to assist you and your representatives in this matter if you so desire. Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Oct. 22, 1958

Mr. William C. Moulton
Palmer Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, of the General Laws of the Commonwealth of Massachusetts relative to the inspection, condition, and safety of the dams in Hampden County, you are hereby advised that at Smith Pond in Monson at a point near the northerly end of Smith Pond, a washout has been noted during routine inspection of the dam at Smith Pond. It is the understanding of this Board that the location of the washout is on your property. Your attention is called to the following condition noted and recommendations made by the County Hydraulic Engineer.

"Brush and trees growing at the right abutment should be cut down. It would be advisable to make repairs at the north end of the pond where earth has been washed out in the vicinity of the drawdown pipes. Repairs could easily be made by filling this washout with riprap or by constructing a concrete retaining wall and then filling behind the wall with earth."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

C.F. CHURCH MANUFACTURING CO.Division of **AMERICAN - Standard****Molded Plastic Products**

COMPRESSION • TRANSFER • INJECTION • EXTRUSION

MAIN OFFICE

HOLYOKE, MASSACHUSETTS

October 24, 1958

Address reply to
Monson, Mass.HOLYOKE, MASS.
MONSON, MASS.
BRATTLEBORO, VT.TOILET SEATS
STYRENE WALL TILE
MOLDED PLASTIC AND
FIBROUS GLASS PRODUCTSCommonwealth of Massachusetts
Board of County Commissioners
County of Hampden
37 Elm Street
Springfield, Massachusetts

Gentlemen:

I reply to your letter of October 22 addressed to the C. F. Church Division of American-Standard, Monson, Mass. regarding leakage of water on the down stream side of our dam on the west wall. This condition was observed by your County Hydraulic Engineer during a recent inspection.

Please arrange a meeting with your Engineer and myself, preferably at our plant so that we may in some way correct this condition.

Having been here at this plant while the flood waters of 1955 were receding, and following the emergency repairs made by the State and Town very closely, I am sure I can enlighten your Engineer as to why this condition exists.

The area from our plant west wall was completely washed out along with the roadway during the flood. The State Highway Department employed the Hill Construction Company on an emergency basis to restore the roadway at that point so that transportation in and out of Monson could be restored. During the filling of this area such materials as tree stumps and very large boulders, washed down from Mill Street, were used as fill. Unfortunately, this material was not packed with finer gravel to make solid base material. As a result, when the new gate was installed in the Company dam and the pond filled, these porous spots were noted and has been leaking since that time.

The C. F. Church Division Management is very desirous of clearing this situation, and hopes we may meet with your Engineer so that an early solution can be concluded.

Very truly yours,

William J. Birmingham
Plant Engineer
C. F. CHURCH DIVISION
American-Standard

an

Copy of this letter mailed to George H. McDonnell,
County Hydraulic Engineer, on October 31, 1958.



GEORGE H. MC DONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON
TEL. JEFFERSON 3-3991

TIGHE & BOND
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS

CIVIL, SANITARY AND
ELECTRICAL ENGINEERING
SUPERVISION OF CONSTRUCTION
AND OPERATION
INVESTIGATIONS, REPORTS,
PLANS AND SPECIFICATIONS

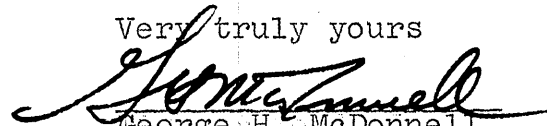
CD Monson
Nov. 4, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

In reference to the letter from the C.F.Church Mfg
Company, dated Oct. 24, 1958, pertaining to the leakage,
I have written to Mr. Birmingham, Plant Engineer, in
accordance with his request, regarding a conference on
this matter. A copy of my letter to Mr. Birmingham is
enclosed. The contents of this letter are self explanatory.

Very truly yours


George H. McDonnell
County Hydraulic Engr

enc.
GHM/cmb

CD Monson
Nov. 4, 1958

C. F. Church Co.,
Monson, Mass.

Att: Wm. J. Birmingham
Plant Engineer

Gentlemen:

Reference is made to the letter sent to the County Commissioners on Oct. 24, 1958, in connection with the inspection report of the undersigned, on your dam, particularly leakage at the left abutment.

In accordance with your request, the undersigned can meet you at your office in Monson, on Thursday, Nov. 13, 1958. Unless I hear from you, I will be at your office at that time.

If this day and time conflicts with your schedule, kindly let me know and I will arrange another day or hour for my visit.

Very truly yours

George H. McDonnell
County Hydraulic Engr.

GHM/emb

GEORGE H. McDONNELL

PHILIP W. SHERIDAN

EDWARD J. BAYON

TEL. JEFFERSON 3-3991

TIGHE & BOND
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS

CIVIL, SANITARY AND
ELECTRICAL ENGINEERING
SUPERVISION OF CONSTRUCTION
AND OPERATION
INVESTIGATIONS, REPORTS,
PLANS AND SPECIFICATIONS

CD Monson
Nov. 18, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

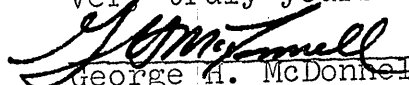
Reference is made to the dam at the Church Mfg Company, in Monson and to the communications in connection therewith. The undersigned has met in Monson at the site of the dam with representatives of the Church Mfg Co., regarding the leakage around the left abutment. The undersigned pointed out to the Church Mfg Co., representatives that existing conditions apparently result in full hydrostatic head acting against the downstream wall at the left abutment and that unless it is certain this wall has been designed for full hydrostatic head, steps should be taken to reduce the level of the water in the soil behind the wall.

The representatives from Church Mfg Co., have no information or drawings regarding this wall and cannot be certain that the wall will take the full hydrostatic head now against it. They pointed out that immediately following the flood of 1955, the road area that had been washed out was filled in by a contractor for the state and in filling in the road, coarse material, large boulders, tree stumps and logs from trees themselves were all pushed into the cavity. With a fill of this type it was felt by the representatives of the Church Mfg Co., that seepage is bound to occur around the dam and cause the condition at the wall.

It was agreed that the company would excavate behind the wall and install a drain pipe to lower the water level and to reduce the hydrostatic head. The representatives also indicated that they would contact their legal advisors regarding a meeting with State authorities to determine whether or not the State would take any corrective action regarding the fill.

The above is sent to you as a matter of information as to the status of conditions at this site and the Church Mfg Company is to notify the undersigned when the perforated pipe drain is to be installed behind the wall, so an inspection of the wall and the installation can be made.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

GHM/cmb

Copy of this letter mailed December 2, 1958 to George H. McDonnell, County Hydraulic Engineer.

BROOKS, LYON & CURLEY
ATTORNEYS AND COUNSELORS AT LAW
56 SUFFOLK STREET
HOLYOKE, MASSACHUSETTS
JEFFERSON 2-9456

ELIOT P. BROOKS
CLARKE S. LYON
ROBERT J. CURLEY

ASSOCIATE COUNSEL
ADDISON B. GREEN

November 21, 1958

Hampden County Commissioners
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Subsequent to your letter of October 22 relative to the dam of C. F. Church Division - American-Standard, at Monson, the Company representatives had a conference with your engineer, Mr. George H. McDonnell of Tighe and Bond, Holyoke. Preparatory to laying perforated pipe on the westerly side of the wall for purposes of drainage, the Company excavated the necessary trench, and at that time had Mr. McDonnell view the work. We understand that his then inspection of the wall and conditions surrounding the same convinced him that this abutment wall would retain full hydrostatic head and that not even the perforated drainage pipe procedure was required.

This being so, will you kindly forward to the Company, but in care of this office, a revised report in connection with the condition and capacities of this dam and abutment wall.

The Company does appreciate your having brought to its attention what might have been a potentially serious situation had the wall been otherwise than this last inspection showed.

Very truly yours,

BROOKS, LYON & CURLEY

By *Eliot P. Brooks*

EPB:es

Received - November 26, 1958

GEORGE H. McDONNELL

PHILIP W. SHERIDAN

EDWARD J. BAYON

TEL. JEFFERSON 3-3991

TIGHE & BOND
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS

CIVIL, SANITARY AND
ELECTRICAL ENGINEERING
SUPERVISION OF CONSTRUCTION
AND OPERATION
INVESTIGATIONS, REPORTS,
PLANS AND SPECIFICATIONS

CD Monson
Nov. 26, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm St.
Springfield, Mass.

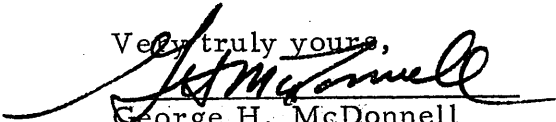
Gentlemen:

The undersigned has made further inspection of the wall at the dam of the Church Manufacturing Co. in Monson in connection with the hydrostatic head that is against the wall as the result of leakage of pond water around the left abutment. The Church Manufacturing Co. excavated behind the wall in preparation for the installation of a drainage pipe to reduce this hydrostatic head. After the excavation had been opened, a true picture of the size and mass of the wall could be obtained. Based upon measurements made regarding the size of the wall and calculations of loading as the result of the hydrostatic head, the undersigned is of the opinion that though the loading is high, the wall in all probability will withstand this load. As evidence of this fact, the wall apparently has been loaded for some time with this full hydrostatic head and there is no evidence of any movement at any part of the wall or at any of the joints in the wall.

I am enclosing herewith a copy of my communication directed to Mr. Birmingham of the Church Manufacturing Co. as requested by him. The contents of the letter are self-explanatory.

The wall will be watched at the time of periodic inspections at the dam.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/f

Nov. 26, 1958

Church Mfg Co.,
Monson, Mass.

Att: Wm. Birmingham

Gentlemen:

Reference is made to my discussion with you in the field pertaining to the condition of the wall just downstream from your dam and adjacent to the highway in Monson. Based upon measurements taken by you and witnessed by the undersigned at the site of this wall after the back of the wall had been excavated, and based upon general conditions of loading on the wall, it is the opinion of the undersigned that though this wall is heavily loaded, as the result of hydrostatic head behind the wall, there will probably be no movement at this wall as the result of the loading. Computations regarding the wall indicate that the resultant of the forces falls in such a location as to result in some tension occurring on the back of the wall. This condition has occurred in the field and a close observance of the wall indicates that no movement has taken place as the result of the hydrostatic loading.

The wall should be observed from time to time to be certain that if any movement does occur, the movement will be detected and any corrective action necessary can then be taken.

In summary, following the observation of conditions in the field and a review of the situation in the office, I believe your action in backfilling the wall without installing the drainage is satisfactory.

I call your attention to the moist condition of the ground noted at one particular location behind the wall in question. There is a possibility that if a heavy load is placed on the surface of the ground at this or an adjoining location, the increased forces on the wall as the result of the load might cause damage to the wall. It would seem advisable to protect the area back of the wall so that no superimposed loads could be placed upon the earth.

Very truly yours
Tighe & Bond, Inc.

George H. McDonnell
County Hydraulic Engineer

GHM/cmb

CD Monson

Dec. 4, 1958

Brooks, Lyon & Curley
Attorneys and Counselors at Law
56 Suffolk Street
Holyoke, Mass.

Att: Elliott Brooks, Attorney

Dear Elliott:

Reference is made to your letter of November 21, 1958, to the County Commissioners, particularly the second paragraph where you ask that the Board kindly forward to the Company, but in care of your office, a revised report in connection with the condition and capacities of the dam of the Church Manufacturing Co. in Monson. I have submitted various letters to the Church Co. and I believe copies were sent to you. Are the communications now in the hands of yourself and your client satisfactory for your needs? If not, then a summary of the communications sent can be prepared and forwarded to you by the County Commissioners.

The Commissioners have asked me to take care of this matter for them since I did the inspecting at the dam.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson


Dec. 4, 1958

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

In connection with the letter from Brooks, Lyon & Curley, of November 21, 1958, I have written to Attorney Elliott P. Brooks regarding his request for copies of communications being sent to him. The contents of my letter to Attorney Brooks are self-explanatory. I believe that between his office and the office of Church Manufacturing Co., the necessary letters have already been received by the parties involved.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

Sept. 16, 1959

W.C. Moulton
Palmer Lower Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et. seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook upstream from the Church Manufacturing Co. Dam has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"No water was found stored behind the dam at the time of the last inspection. The flow of the brook passed thru the wheel pit at the site of the old power installation. The central section of the bar rack has been hoisted enough to allow for normal flow of the brook. Heavy runoff could result in the quantity of water flowing to be in excess of the free unscreened opening. It would seem advisable to remove all of the bar racks from in front of the waterway so that debris will not collect thereon and thus guarantee increased flow capacity.

The dam itself is in need of maintenance and repairs. If it is not to be activated again, then it would seem advisable for the owner to breach the structure so that there will be a wide free waterway for the passage of flood flows."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Oct. 5, 1960

Mr. W. C. Moulton
Palmer Lower Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook upstream from the Church Manufacturing Co. dam has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The gates at this dam were found to be closed but water leakage occurring in the wheel pit and thru the gate at the center of the dam, as well as thru the dam masonry itself, results in little water being ponded above the dam. A large portion of the pond is silted and a large sand and gravel bar with its surface elevation at about the elevation of the dam crest occupies almost all of the storage volume in the pond. Failure of the dam would release very little water downstream. With the passing of time, the surface area of the sand and gravel bar upstream of the dam is becoming overgrown with vegetation.

Stone blocks in the masonry dam and concrete at the face of the spillway at about the center of the dam need maintenance and replacing. If the dam is to be maintained for use, it should be properly repaired. If the dam is not to be used again, the structure should be breached and all gates, as well as stop logs at the wheel pit left wide open."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

November 2, 1966

Mr. W. C. Moulton
Palmer Lower Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook, upstream from the Church Manufacturing Company dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is in very poor condition. The concrete center section shows much erosion, particularly on the downstream face. The stone block section to the right of the concrete portion of the dam and at about the one-third point from the right abutment is unraveling and the ends of some of the stones are no longer properly supported. These stones will become dislodged in the future and failure of the dam could occur, especially during time of flood flow conditions.

Water level in storage on the day of inspection was about one foot or more below the crest of the dam. The pond back of the dam has been fairly well filled up with sands and gravels washed down from upstream by flood flows and, consequently, the pond formed by the dam is now quite small in total volume.

Trees growing from the right abutment and along the right dike should all be cut down. Leakage could occur along root structure and uprooting of these trees by storm winds could cause the formation of a sizeable breach at the abutment or in the dike itself.

It is recommended that the owner of the dam be advised to rebuild the dam as needed and to maintain the structure in accordance with the herein-contained recommendations or the dam should be breached so that, even during flood flows, water will not be stored."

Mr. W. C. Moulton

-2-

November 2, 1966

In accordance with the report of the County Hydraulic Engineer, the condition of your dam is quite poor and our Board concurs in that you should either properly repair the dam or abandon it by breaching it so that no water will be stored in the future.

Recommendations for repairs and maintenance to this dam have been sent to you in the past but no action has been taken.

It is requested that within 30 days of the receipt of this communication you notify our Board of what action you plan to take in connection with either repairing or breaching the dam. If repairs are to be made, then a description of the work to be done should be filed with our Board prior to any work being started.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



Commonwealth of Massachusetts

COPY

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph P. Walsh
Floyd W. Fradet

October 16, 1968

C. F. Church Manufacturing Company
Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook adjacent to your plant has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is in the same general condition as reported on April 8, 1968.

The spillway portion of this dam was found to be satisfactory. There were no flashboards on the crest and water was overflowing the crest. Brush growth previously reported at the right abutment of the dam and at about the end of the crest of the dam has been cut. However, the root structure is still present. This root structure should be killed or removed so that there will not be any opportunity for re-growth of this brush.

The same comment applies to brush and vegetation growing from the masonry in the vicinity of the drawdown gate structure. All of this growth should be dug out of the masonry joints or the root structure killed.

A surface sink hole reported previously at the front corner of the left abutment of the dam still exists and there is ample evidence that surface water in time of storm run-off collects in the sink hole and passes down thru the ground to emerge from the base of the abutment wall just downstream of the gate structure.

COPY

Subsurface water passes around and behind the left abutment. This condition has been occurring for years and does not as yet endanger the dam. The seepage water is relieved thru an opening at the base of the masonry on the downstream side of the drawdown gate structure. Relief of the water at this point prevents build-up of pressure behind the abutment wall and the downstream training wall. It is thru this same opening that surface water emerges after passing into the sink hole.

This sink hole will become larger and the continuous wash of surface water thru the soil will deteriorate conditions behind the abutment. The sink hole should be filled with coarse material and surface runoff should be directed over or around the area. If the area is paved, to prevent entrance of surface water into the ground at this location, it can be expected that the paving will fail from time to time due to settlement of the ground at the location of the sink hole. Any paving placed here must be repaired from time to time. By backfilling the sink hole, from time to time, with a coarser material than sandy gravel, it is possible that stabilization may eventually occur and there will be no further washing out of the sand thru the seepage opening at the base of the abutment wall.

There is evidence of a second seepage hole just north of the one described and at the location of the second guard rail post from the southerly end of the adjacent guard rail. This sink hole should also be filled with compacted material.

The owner was advised of this condition in a letter from your Board on April 10, 1968. The owner should be notified that corrective action should be taken at this dam. "

You have been advised previously, in a communication from our Board on April 10, 1968, of the maintenance and repair work needed at the dam. Little or nothing has been done in the 6 months since our letter to you.

The recommendations contained in this second report from the County Hydraulic Engineer should be followed and the required corrective action taken before cold weather. In the interests of safety and the protection of your investment in this dam, the repairs should not be delayed.

COPY

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



AMERICAN
STANDARD

PLUMBING & HEATING DIVISION

C. F. Church

CHURCH PRODUCTS DEPARTMENT / PALMER ROAD, MONSON, MASSACHUSETTS 01057 / (413) 267-5511

November 19, 1968

County Commissioners' Office
52 State Street
Springfield, Mass.

Gentlemen:

Please be advised that the recommendations noted in your communication of October 16, relative to our dam and the adjacent area, have been complied with as of this date.

The surface sink holes have been filled with coarse material and paved. In addition, the root structure has been removed to inhibit future growth of brush in this area.

A large elm tree, found in a state of decay, has also been removed to preclude its eventual collapse and possible restriction of the flow of water in the Chicopee Brook.

Sincerely,

P. T. L'Abbee

Paul T. L'Abbee, Manager
Manufacturing Engineering



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXX~~

Floyd W. Fradet

Stephen A. Moynahan

October 22, 1969

American-Standard Church Products
Palmer Road
Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook adjacent to your plant has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The dam itself is in good condition. On the day of inspection water in storage at the dam was passing over the crest. There were no flashboards on the crest. The growth of vegetation noted and reported from time to time in the past at joints and cracks in the masonry has been controlled and cut down.

The toe area in the stream bed is o.k. The right abutment and its related flood flow training wall are o.k.

The left abutment and the drawdown gate proper were both noted to be satisfactory. A sizeable leak discharges from the base of the left wall of the gate structure just downstream of the face of the drawdown gate itself. No other seepage of any quantity occurs from the left concrete and stone masonry wall. The leak is the result of pond water passing around the left abutment in the natural sandy soil which exists between the abutment and the paving of the adjacent State Highway, Route 32. Leakage has occurred in this area, particularly since the flood of August 1955 when the material that was back filled in a wash-out was of a pervious and gravelly nature. The leakage was observed for a few minutes and no grains of soil were observed

being discharged with the water. A careful examination of the surface of the ground between the abutment and the road indicated no surface settlement.

The surface of the ground adjacent to the left abutment has been paved with type-I material and surface drainage is directed over the abutment wall below the dam. Also, surface drainage paving has been placed from the southern end of the parking lot across road to and over the abutment wall. As a result, no surface water run-off can now soak into the ground thru the coarse soil behind the abutment. In the opinion of the undersigned, the leakage does not endanger the dam.

The owner should observe the area of the left abutment from time to time and if any settlement of the surface soil begins to occur, corrective steps should be taken to prevent any major settlement or wash-out of the earth area between the left abutment and the highway."

In the opinion of the undersigned, the dam itself is safe.

As recommended by the County Hydraulic Engineer, you should observe the area at the left abutment from time to time so that corrective action can be taken, if the water flowing through the ground results in any settlement or movement of soil.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

By: _____

Central Massachusetts Electric Company Dam



1948 Monson

Dam located on the Quaboag River.

| | |
|-----------|--|
| City/Town | Monson |
| Dam | Central Massachusetts Electric Company Dam |
| Name | Central Massachusetts Electric Company |
| Water | Quaboag River |

September 21, 1948

Central Mass. Electric Co.
Palmer, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on the Quaboag River in the Towns of Palmer and Monson has been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"In a recent inspection of the Central Mass. Electric Company dam located in Monson and Palmer on the Quaboag River, it was found that the timber apron is badly broken up and in need of repair. There is a heavy concentration of leakage through the structure which should be plugged up and repaired during the low water season."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

Chairman

CENTRAL MASSACHUSETTS ELECTRIC COMPANY

465 North Main Street

Palmer, Massachusetts

September 8, 1948

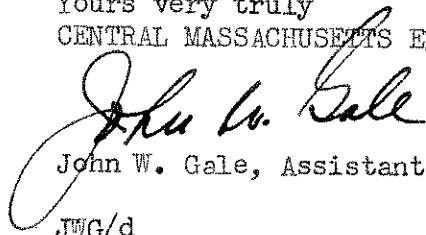
County Commissioners
County of Hampden
37 Elm Street
Springfield, Massachusetts

Gentlemen:

I have your letter of September 1 calling attention to needed repairs on the apron of our dam on the Quaboag River.

We have plans for repairing the apron and are hopeful we will be able to do it fairly soon. We have already made arrangements for the contractor who will do the work.

Yours very truly
CENTRAL MASSACHUSETTS ELECTRIC COMPANY



John W. Gale, Assistant District Manager

JWG/d

Copy of this letter mailed to Mr. Bond,
County Hydraulic Engineer, on Sept. 10, 1948.

Norris Dam



1933 Monson

Located on small tributary of Chicopee Brook.

| | |
|-----------|-----------------|
| City/Town | Monson |
| Dam | Norris Dam |
| Name | Norris, Charles |
| Water | Chicopee Brook |

April 26, 1933

Mr. Charles Norris,
Academy Hill,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that the Horace Bumstead Estate dam, located on a tributary of Chicopee Brook in the Town of Monson, has been inspected by our engineer and your attention is called to the following condition noted and recommendation made by him;

"Some of the stonework at the south side of the spillway has become loose. This stonework should be relaid, preferably in cement mortar."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendation be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Conant Brook Dam & Reservoir Project



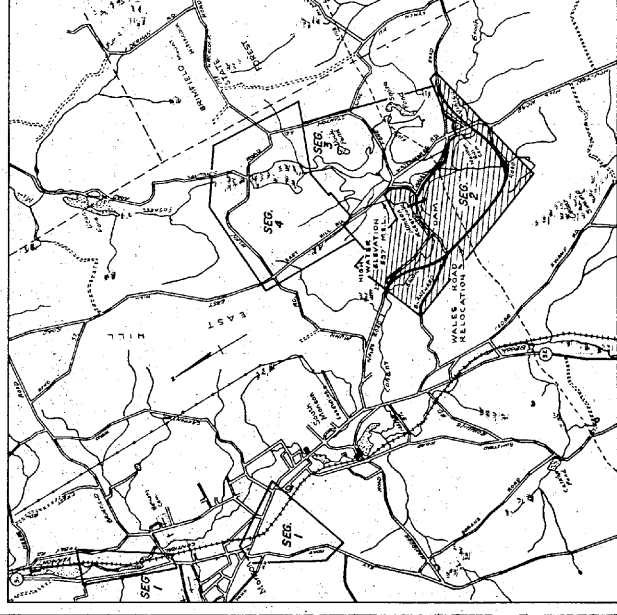
1964 Monson

Also see: Dam Report Section - Monson and Connecticut River Flood Control - Conant Brook Dam - Vol. I, Vol. II & Vol. III. - D25009; D25010 & D25011.

| | |
|-----------|--------------------------------------|
| City/Town | Monson |
| Dam | Conant Brook Dam & Reservoir Project |
| Dam | Conant Dam |
| Name | U S Army Engineers - New England |
| Name | Sutcliffe, R S |
| Name | U S A |
| Streets | Old Wales Road |
| Streets | Wales Road |
| Streets | Moore's Cross Road |
| Streets | Sutcliffe Road |
| Streets | New Wales Road |
| Streets | Munn Road |
| Streets | East Hill Road |
| Streets | Pond Road |
| Streets | Water Works Road |

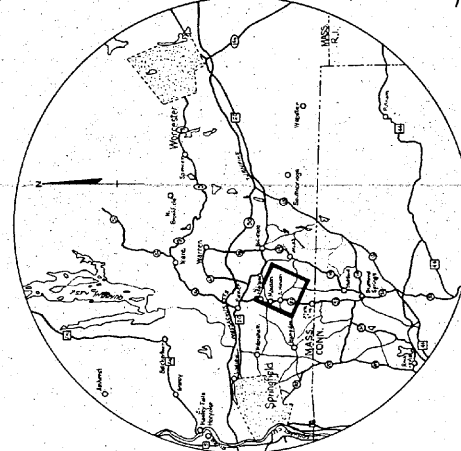
TRACT REGISTER OF ACQUISITION AFTER 1 JAN. 1943 (CIVIL)

| TRACT NO. | LAND OWNER | ACREAGE | | REMARKS |
|-----------|------------------------------|---------|--------|------------------------|
| | | FEE | LEASED | |
| 200 | ARTHUR C. NORTH ET UX | 49.50 | | |
| 201 | EVELYN S. LINTON SHAW | 34.50 | | |
| 202 | HOWARD L. HATCH ET UX | 2.24 | | |
| | | | | |
| 203 | GEORGE BROWN | 0.33 | | |
| 204 | HEIRS OF WALTER R. DAVIS | 0.02 | | |
| 205 | DWIGHT W. POULIN ET UX | 0.47 | | |
| 206 | CATHERIN W. BRUCE | 1.70 | 0.21 | PERP. SLOPE ESMT. FROM |
| 206E1 | CATHERIN W. BRUCE | | 0.12 | PERP. SLOPE ESMT. FROM |
| 206E2 | CATHERIN W. BRUCE | | 0.09 | PERP. SLOPE ESMT. FROM |
| 206E3 | CATHERIN W. BRUCE | | 0.06 | PERP. SLOPE ESMT. FROM |
| 206E4 | CATHERIN W. BRUCE | | 0.06 | PERP. SLOPE ESMT. FROM |
| 207 | GLADYS A. MOFFETT | 6.50 | | |
| 207E1 | GLADYS A. MOFFETT | | 0.06 | PERP. SLOPE ESMT. FROM |
| 207E2 | GLADYS A. MOFFETT | | 0.03 | PERP. SLOPE ESMT. FROM |
| 207E3 | GLADYS A. MOFFETT | | 0.06 | PERP. SLOPE ESMT. FROM |
| 208 | BURT T. ROYCE | 1.07 | | |
| 208E1 | BURT T. ROYCE | | 0.22 | PERP. SLOPE ESMT. FROM |
| 208E2 | BURT T. ROYCE | | 0.07 | PERP. SLOPE ESMT. FROM |
| 209 | GEORGE DUBOSH ET UX | 3.26 | | |
| 209E1 | GEORGE DUBOSH ET UX | | 0.18 | PERP. SLOPE ESMT. FROM |
| 209E2 | GEORGE DUBOSH ET UX | | 0.08 | PERP. SLOPE ESMT. FROM |
| 209E3 | GEORGE DUBOSH ET UX | | 0.16 | PERP. SLOPE ESMT. FROM |
| 209E4 | GEORGE DUBOSH ET UX | | 0.05 | PERP. SLOPE ESMT. FROM |
| 210 | BURT T. ROYCE | 1.81 | | |
| 210E1 | BURT T. ROYCE | | 0.09 | PERP. SLOPE ESMT. FROM |
| 210E2 | BURT T. ROYCE | | 0.10 | PERP. SLOPE ESMT. FROM |
| 210E3 | BURT T. ROYCE | | 0.09 | PERP. SLOPE ESMT. FROM |
| 211 | RAY H. PLUMLEY ET UX | 24.55 | | |
| 211E1 | RAY H. PLUMLEY ET UX | | 0.11 | PERP. SLOPE ESMT. FROM |
| 211E2 | RAY H. PLUMLEY ET UX | | 0.10 | PERP. SLOPE ESMT. FROM |
| 212 | DAVID J. ASQUITH ET UX | 2.03 | | |
| 212E1 | DAVID J. ASQUITH ET UX | | 0.33 | PERP. SLOPE ESMT. FROM |
| 213 | WILFORD F. PLUMLEY ET UX | 12.48 | | |
| 214 | TOWN OF MONSON | 1.75 | | |
| 215 | TOWN OF MONSON | 4.14 | | |
| 216 | HAMPDEN COUNTY COMMISSIONERS | 4.67 | | |
| 217 | JOSEPH E. SLOWICK, JR. | 0.11 | | |



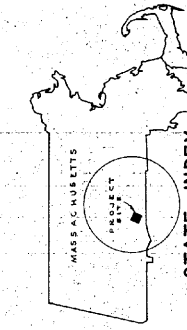
SEGMENT INDEX

SCALE IN FEET

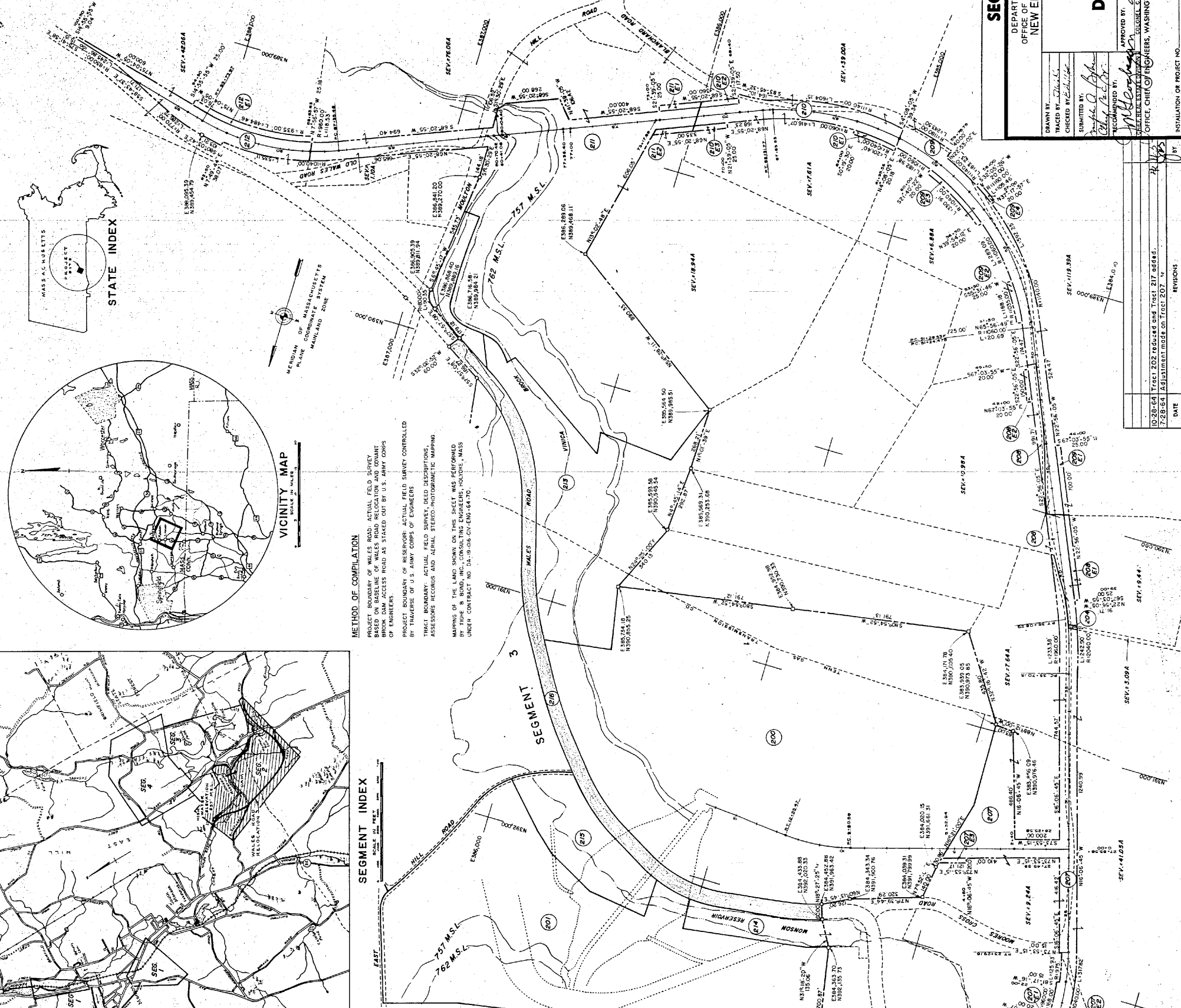


VICINITY MAP

SCALE IN MILES



STATE INDEX



METHOD OF COMPILATION

PROJECT BOUNDARY OF WALES ROAD: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF MONSON ROAD: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF RESERVOIR: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF WALES ROAD: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF MONSON ROAD: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF RESERVOIR: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF WALES ROAD: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF MONSON ROAD: ACTUAL FIELD SURVEY. PROJECT BOUNDARY OF RESERVOIR: ACTUAL FIELD SURVEY.

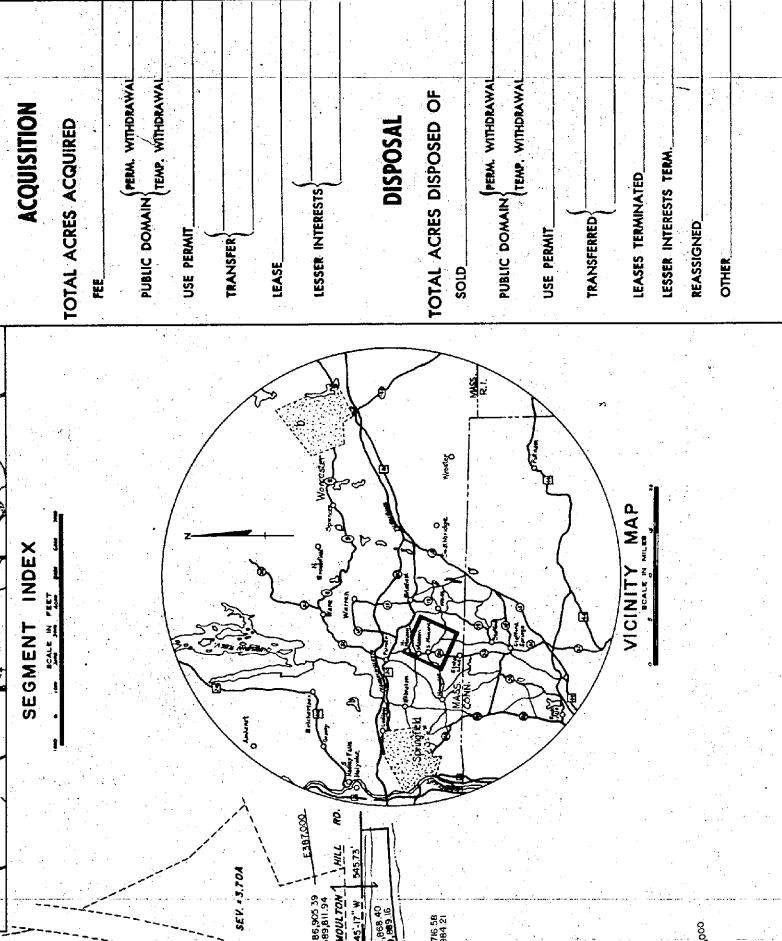
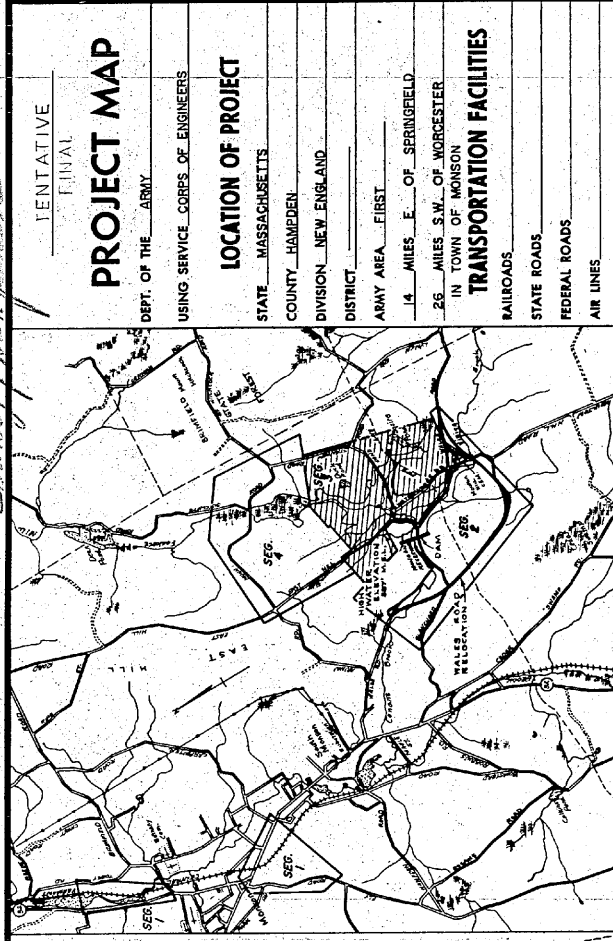
MAPPING OF THE LAND SHOWN ON THIS SHEET WAS PERFORMED BY THE U.S. ARMY CORPS OF ENGINEERS, WASHINGTON, D.C. UNDER CONTRACT NO. DA-19-016-01-240-64-70.

PROJECT MAP

INITIATIVE
FINAL
DEPT. OF THE ARMY
USING SERVICE CORPS OF ENGINEERS
LOCATION OF PROJECT
STATE MASSACHUSETTS
COUNTY HAMPTEN
DIVISION NEW ENGLAND
DISTRICT
ARMY AREA FIRST
1/4 MILES E. OF SPRINGFIELD
26 MILES S.W. OF WORCESTER
IN TOWN OF MONSON
TRANSPORTATION FACILITIES
RAILROADS
STATE ROADS
FEDERAL ROADS
AIR LINES
ACQUISITION
TOTAL ACRES ACQUIRED
FEE
PUBLIC DOMAIN
TEMP. WITHDRAWAL
USE PERMIT
TRANSFER
LEASE
LESSER INTERESTS
DISPOSAL
TOTAL ACRES DISPOSED OF
SOLD
PUBLIC DOMAIN
TEMP. WITHDRAWAL
USE PERMIT
TRANSFERRED
LEASES TERMINATED
LESSER INTERESTS TEMP.
REASSIGNED
OTHER
LEGEND
EXCEPT FOR THE SPECIAL SYMBOLS SHOWN BELOW MAP SYMBOLS ARE STANDARD IN ARMY MAP SERVICE TECHNICAL MANUAL NO. 23.
RESERVATION LINE
RESERVATION LINE (Actual Survey)
TRACT BOUNDARY LINE
TRACT NUMBER
CONTOUR LINE
DISPOSAL

SEGMENT '2'

DEPARTMENT OF THE ARMY
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION
REAL ESTATE
CONANT BROOK
DAM & RESERVOIR
DRAWN BY
CHECKED BY
SUBMITTED BY
RECOMMENDED BY
APPROVED BY
DATE JULY 1964
OFFICE, CHIEF OF ENGINEERS, WASHINGTON 25, D. C.
SHEET NO. 1733
DRAWING NO. 1733
PREVIOUS EDITIONS ARE OBSOLETE



| TRACT REGISTER OF ACQUISITION AFTER 1 JAN. 1943 (CIVIL) | | REMARKS | |
|---|----------------------------|---------|---------|
| TRACT NO. | LAND OWNER | ACREAGE | REMARKS |
| 300 | TOWN OF MONSON | 144.00 | |
| 301-1 | RICHARD S. SUTCLIFFE ET UX | 85.50 | |
| 301-2 | RICHARD S. SUTCLIFFE ET UX | 1.26 | |

PROJECT MAP

DEPT. OF THE ARMY

USING SERVICE CORPS OF ENGINEERS

LOCATION OF PROJECT

STATE MASSACHUSETTS

COUNTY HAMPDEN

DIVISION NEW ENGLAND

DISTRICT

ARMY AREA FIRST

14 MILES E. OF SPRINGFIELD

25 MILES S.W. OF WORCESTER

IN TOWN OF MONSON

TRANSPORTATION FACILITIES

RAILROADS

STATE ROADS

FEDERAL ROADS

AIR LINES

ACQUISITION

TOTAL ACRES ACQUIRED

FEE

PUBLIC DOMAIN

TEMP. WITHDRAWAL

USE PERMIT

TRANSFER

LEASE

LESSER INTERESTS

DISPOSAL

TOTAL ACRES DISPOSED OF

SOLD

PUBLIC DOMAIN

TEMP. WITHDRAWAL

USE PERMIT

TRANSFERRED

LEASES TERMINATED

LESSER INTERESTS TERM

REASSIGNED

OTHER

LEGEND

EXCEPT FOR THE SPECIAL SYMBOLS SHOWN BELOW MAP SYMBOLS ARE STANDARD IN ARMY MAP SERVICE TECHNICAL MANUAL NO. 21.

RESERVATION LINE

RESERVATION LINE (Actual Survey)

TRACT BOUNDARY LINE

TRACT NUMBER

CONTOUR LINE

DISPOSAL

SEGMENT '3'

DEPARTMENT OF THE ARMY

OFFICE OF THE DIVISION ENGINEER

NEW ENGLAND DIVISION

REAL ESTATE

CONANT BROOK DAM & RESERVOIR

DRAWN BY: [Signature]

CHECKED BY: [Signature]

SUBMITTED BY: [Signature]

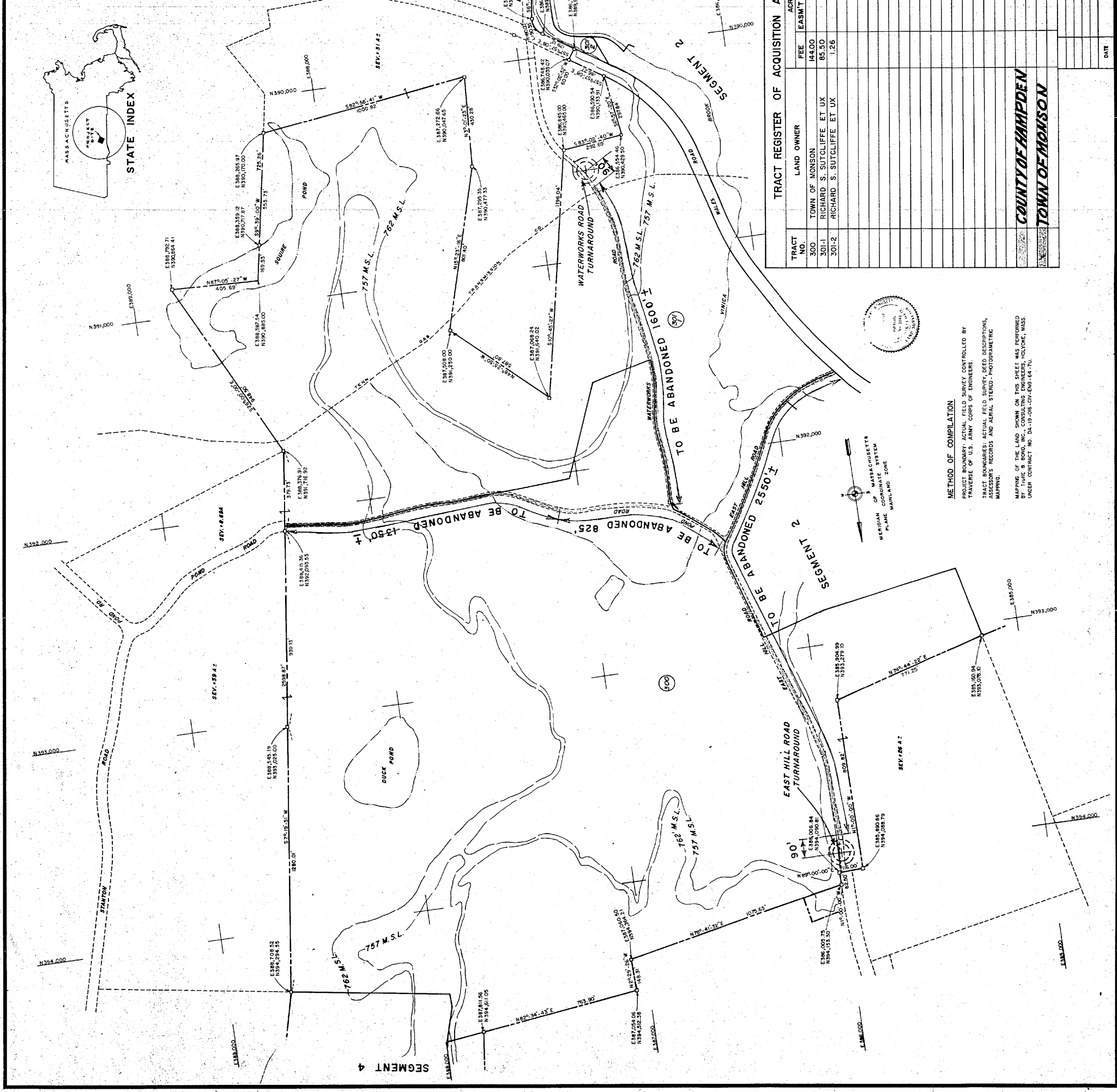
APPROVED BY: [Signature]

DATE: JULY 1964

OFFICE, CHIEF OF ENGINEERS, WASHINGTON 25, D. C.

INSTALLATION OF PROJECT NO.

SHRINKAGE NO. 173.5



NEDRE-A

21 January 1964

Mr. Thomas F. Sullivan, Chairman
Hampden County Commissioners
37 Elm Street
Springfield, Massachusetts

Dear Mr. Sullivan:

Re: Conant Brook Dam and Reservoir Project -
Highway Relocations-Monson, Massachusetts

Construction of the highway relocations for the subject flood control project is scheduled to begin this Spring. Because some of the highways concerned were laid out by the County and are maintained by the Town of Monson, the relocation agreement has been drawn to include both the County and Town as parties. The agreement is similar to the contract now in effect at the Littleville flood control project in the Town of Chester.

Due to the imminence of construction and the time needed for processing these instruments, an early meeting with the County Commissioners is desired. It is suggested that such meeting be held in your office at 11:00 A.M. on Wednesday, January 29, 1964. Attorney Morris S. Phillips and Mr. George Haskins, the highway engineer, both of this office will plan to attend. Please confirm at your earliest opportunity.

Very truly yours,

J. M. GEOGHEGAN
Chief, Real Estate Division

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54, MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO. NEDRE-A

21 January 1964

Mr. Thomas F. Sullivan, Chairman
Hampden County Commissioners
37 Elm Street
Springfield, Massachusetts

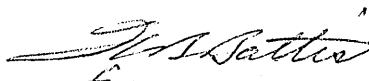
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Very truly yours,


for
J. M. GEOGHEGAN

Chief, Real Estate Division

[Handwritten notes and signatures at the bottom of the page]

CONTRACT NO. DA-19-016-CIVENG-64-

DATE

CONTRACT FOR RELOCATION, REARRANGEMENT AND/OR ALTERATION
OF FACILITIES
(COST REIMBURSABLE)

Contractor: Town of Monson and County of Hampden,
Massachusetts

Contract For: Relocation, Rearrangement and/or
Alteration of Highway Facilities

Location: Conant Brook Dam and Reservoir Project,
Massachusetts

This contract is authorized by the following law:

Act of Congress Approved 14 July 1960
(Public Law 86-645, 86th Congress, 74 Stat 480)

Appropriation: 96X3122 Construction General
Corps of Engineers, Civil

CONTRACT NO. DA-19-016-CIVENG-64-

DATE

CONTRACT WITH TOWN OF MONSON AND COUNTY OF HAMPDEN, MASSACHUSETTS
FOR RELOCATION, REARRANGEMENT, AND/OR ALTERATION OF FACILITIES

(COST REIMBURSABLE)

THIS CONTRACT, entered into this _____ day of _____ 1964, between the UNITED STATES OF AMERICA (hereinafter called the "GOVERNMENT"), represented by the Contracting Officer executing this contract, and the TOWN OF MONSON, a municipal corporation in the County of Hampden, Commonwealth of Massachusetts, (hereinafter called the "TOWN"), acting by and through its Board of Selectmen, and the COUNTY OF HAMPDEN, also in the Commonwealth of Massachusetts, (hereinafter called the "COUNTY"), acting by and through its County Commissioners.

WITNESSETH, that:

WHEREAS, the Government has under authority of Public Law No. 86-645, 86th Congress (74 Stat. 480), approved July 14, 1960, undertaken the development of a flood control project known as the "Conant Brook Dam and Reservoir Project" (hereinafter called the "PROJECT"); and

WHEREAS, the Town and the County are the holders of certain interests in land, licenses, permits, and statutory authority on which the Town and/or County have constructed and the Town is operating and maintaining certain facilities consisting of highways which interfere with the development and use of the project by the Government; and

WHEREAS, said highway facilities, namely; New Wales Road and a section of Pond Road were originally laid out by the County Commissioners of Hampden County but have been operated and maintained by the Town of Monson as part of its road system for many years; and East Hill Road, Blanchard Road, Water Works Road, the remainder of Pond Road, Sutcliffe Road, Munn Road, Old Wales Road, and Moore's Cross Road were originally laid out by the Town and are operated and maintained by the Town as Town highways; and

WHEREAS, it is necessary in the construction, completion, and enjoyment by the Government of said Project that the aforementioned title, rights, and privileges of the Town and the County be acquired, abandoned, modified and/or restricted, and that said facilities be removed, rearranged and/or altered; and

WHEREAS, the Town and the County are willing to convey, abandon and/or subordinate to the Government all of their right, title and interest in and to said lands and/or rights-of-way and to remove, alter and/or rearrange the said highways in consideration of the payment by the Government of all reasonable and legitimate costs of relocating, rearranging and/or altering said highways and in such a manner as to eliminate interference with construction,

development, use and enjoyment by the Government of said Project; and the Town and the County agree that said consideration constitutes full, just and complete compensation for the acquisition by the Government of the Town's and the County's rights and property; and

WHEREAS, the Town and the County do not desire to perform such work and services hereinafter described in the manner contemplated herein; and

WHEREAS, it has been determined that it is in the best interest of the Government that the Government should make or cause to be made the necessary surveys, plans, specifications and estimates for and incident to the relocation, rearrangement and/or alteration of said highways, and perform or cause to be performed the necessary construction work in connection therewith, and also to acquire the real estate interests needed therefor.

NOW, THEREFORE, in consideration of the faithful performance of each party of the mutual covenants and agreements hereinafter set forth, it is mutually agreed as follows:

ARTICLE 1. Obligations of the Town and the County.-

a. The Town warrants and agrees that East Hill Road, Blanchard Road, Waterworks Road, Sutcliffe Road, Munn Road, a section of Pond Road, Old Wales Road and Moore's Cross Road within or affected by the Conant Brook Dam and Reservoir Area are public highways of the Town of Monson and under the control and jurisdiction of the Town of Monson and its Board of Selectmen; and the Town and the County also warrant and agree that New Wales Road and the remaining section of Pond Road were originally laid out by the County many years ago, that these roads were never discontinued as County highways, and that the Town has been operating and maintaining the same roads as part of the Town's highway system for many years under the control and jurisdiction of its Board of Selectmen.

b. The Town and the County agree to make available to the Government any of the above-mentioned roads for the purpose of constructing and improving the new roads as provided in Article 2 hereafter.

c. The Town and the County agree that they will lay out the relocated New Wales Road including the new connections to New Wales Road, and the Town agrees that it will lay out the rearranged Munn Road and Sutcliffe Road as public highways and upon completion of construction of same, that they will accept them, and that such new sections of roads shall be in full satisfaction for any and all damages and injuries to their systems of roads and highways that have been caused or that may be caused by reason of the construction, maintenance and operation of the Conant Brook Dam and Reservoir Project.

d. The Town, without additional consideration, shall institute and prosecute discontinuation, vacation and abandonment procedures, in accordance with existing State Law for the legal vacation, discontinuance and/or abandonment of approximately 2400 feet of East Hill Road, approximately 675 feet of Pond Road (Town), approximately 1400 feet of Waterworks Road, and the Town and County, without additional consideration, shall institute and prosecute discontinuation, vacation and abandonment procedures, in accordance with existing

State Law for the legal vacation, discontinuance and/or abandonment of approximately 2700 feet of New Wales Road and approximately 825 feet of Pond Road (County within the Conant Brook Dam and Reservoir area, all of which roads are shown delineated in red on plan hereinafter referred to as Exhibit "A", and convey to the Government by good and sufficient deed all of their rights, title, and interest therein, and deliver to the Government releases from all liens and encumbrances on their right, title and interest. The Town and the County further agree to furnish the Government satisfactory evidence that the necessary action has been taken to effect such discontinuance, vacation and abandonment of said roads.

e. The Town and the County further agree, without additional consideration to convey to the Government flowage easement, or assent to the acquisition thereof by condemnation proceeding, or else to subordinate their highway rights to the right of the Government to intermittently flood and overflow all highway slopes, embankments and structures comprising the portion of Munn Road, as shown delineated in green on said Exhibit "A", to elevation 762.0 mean sea level, as may be necessary by reason of operation of the Conant Brook Dam and Reservoir Project.

f. When construction is completed by the Government, the Town and the County will accept a conveyance from the Government of fee simple title and/or easement or right-of-way, subject to the approval of the Secretary of the Army, for the sections of relocated New Wales Road, Sutcliffe Road and for the new connection from relocated New Wales Road to present New Wales Road, and license for the sections of Munn Road and Sutcliffe Road, crossing the dike, in accordance with Article 2 e hereafter.

g. The Town and the County further agree that all costs under this contract will be incurred by the Town and will be processed through the Town only, and all invoices submitted to the Government in payment for such costs will therefore be submitted solely by the Town on its letterhead.

ARTICLE 2. Obligations of the Government.--

a. Subject to the availability of funds the Government shall make, or cause to be made, such necessary field investigations, engineering work and surveys and prepare such drawings, schedules, plans, specifications and detailed cost estimates in connection with the road construction work to be performed hereunder, as may be required, all of which shall be subject to the approval of the Town and the County before any work to which they relate is performed. Any drawings, maps or specifications which may be furnished by the Town and the County shall, if required by the Government, be subject to approval by the Contracting Officer before any work to which they relate is performed. No variance or change in the approved plans, drawings, or specifications or in the performance of the work hereunder shall be made without the written approval of the Contracting Officer.

b. Subject to the availability of funds, the Government shall furnish or cause to be furnished all services, labor, materials, tools and equipment necessary to perform the following construction at the places shown and indicated on plan entitled, "Connecticut River Flood Control - Chicopee River Basin - Conant Brook Dam - Highway Relocations - Chicopee River, Massachusetts", dated March 1963.

Drawing Number HC-1-5877, a copy of which is attached hereto and made a part hereof and designated as Exhibit "A";

(1) Construct or cause to be constructed approximately ten thousand one hundred (10,100) feet of a new highway as a replacement for the section of New Wales Road to be abandoned. This new highway will be constructed with twenty-four (24) foot pavement with $2\frac{1}{2}$ inch bituminous concrete over a 12 inch gravel base with 3 foot gravel shoulders on each side. The location of the new roadway is substantially as shown in blue on said Exhibit "A". MultiPlate metal culverts will be constructed over Conant Brook and Vinica Brook.

(2) Construct or cause to be constructed turnarounds, conforming to customary type in the area, at locations where East Hill Road and Waterworks Road enter the Reservoir area, above the Guide Taking Line Elevation 762.0 feet m.s.l. for the Project. A similar turnaround will also be constructed on Wales Road below the Government dam, if required by the Town and County.

(3) Raise or cause to be raised a section of Munn Road about nine hundred and seventy-five (975) feet in length to a minimum elevation of 771.0 feet m.s.l., and ~~widen~~ or cause to be widened to provide a bituminous treated gravel roadway 20 feet wide with 3 foot gravel shoulders on each side, as shown delineated in brown on said Exhibit "A".

(4) Raise or cause to be raised a section of Sutcliffe Road for a distance of approximately two hundred and twenty (220) feet to meet the grade of the section of Munn Road to be raised under (3) above, also as shown delineated in brown on said Exhibit "A". The raised section shall be constructed of gravel eighteen (18) feet wide.

c. Subject to the availability of funds, the Government shall reimburse the Town for all costs expended in connection with the discontinuance, abandonment and vacation of New Wales Road, Pond Road (Town and County Sections), Waterworks Road, and East Hill Road, and for conveyance of flowage rights on Munn Road, as provided in Article 1 hereof including all items of expense properly chargeable thereto, provided that the Government has approved the proposed expenditure therefor, before incurred; labor, materials, transportation, insurance, overhead charges properly allocable to the work, supervision, surveys, permits, rental of tools, equipment and machinery employed in the work, together with such other items of expense (exclusive of profit to the Town and the County) as should, in the opinion of the Contracting Officer be included in the cost of the work. However, the Government will not reimburse for overtime work unless authority to work overtime is obtained from the Contracting Officer or his duly authorized representative prior thereto; provided, however, that no prior approval to work overtime will be required when emergency conditions or other conditions endangering the safety of life or property require that such overtime be performed. The total cost of such work to be performed by the Town and the County under Article 1 hereof is estimated at \$2000. The total cost of the engineering, construction and related work required to be performed by the Government under Article 2 hereof is estimated at \$390,000. The Government shall reimburse the Town when the required work is completed for its costs upon receipt of properly certified invoices, in quadruplicate, supported by such evidence of payment, made by the Town as may be required by the Contracting Officer. All original time cards or

payrolls, material records, and accounts for all charges and expenditures for which reimbursement will be claimed from the Government shall be available at all reasonable times to allow the Government to check and audit the invoices submitted by the Town. So far as practicable, separate records shall be maintained by the Town on all items and accounts which shall constitute the basis of information from which the invoices will be prepared.

d. The Government agrees to acquire all lands, rights of way, easements or other interest in real property necessary for said relocations or alterations of Town and County highways.

e. The Government shall convey to the Town and the County respectively upon completion of construction, subject to the approval of the Secretary of the Army, fee simple title and/or easement or other real estate interests for the sections of the relocated New Wales Road, Munn Road, Sutcliffe Road and the new connection between relocated New Wales Road and present New Wales Road traversing any lands acquired by the Government on which to maintain and operate the relocated highways herein provided for. The Government excepts and reserves from said conveyances or grants, the right to flood all roadway slopes, embankments and structures within the project up to elevation 762.0 feet m.s.l. for operation of said project as shown delineated in green on said Exhibit "A".

ARTICLE 3. Betterments.-

The Town and the County agree that the relocation, rearrangement and/or alteration to be accomplished under this contract will provide the Town and the County with facilities equal in service and utility to those now in existence and that any improvement in design, construction or capacity over and above what is required to provide facilities of equal service and utility shall constitute a betterment and will be furnished by the Town and the County at their own cost and expense; Provided, however, that the term "betterments" will not be deemed to include more costly construction or design necessitated solely as a result of the relocation.

ARTICLE 4. Ownership and Conduct of the Work.-

a. The facilities constructed hereunder shall be the property of the Town and the County. The Town and the County shall be responsible for all materials furnished and work performed by each of them, respectively.

b. The Government may award other contracts for additional or other work in connection with the same project or in the same vicinity. The Town and the County shall conduct operations so as to cooperate fully with any such work being performed by the Government and/or Government contractors and shall carefully fit their own work to that provided under other contracts as directed by the Contracting Officer. The Town and the County shall not commit or permit any act which may interfere with the performance of any such work by the Government and/or any Government contractor.

ARTICLE 5. Interference.-

The Town and the County agree that, so long as the Project is operated or maintained for the purpose as described herein, the facilities as relocated, rearranged, or altered pursuant to this contract shall not be so further altered or modified nor other facilities constructed by the Town and the County so as to interfere with the operation of the Project.

ARTICLE 6. Inspection and Acceptance.-

The Town and the County shall have the right to inspect the work to be performed hereunder at any time during its progress and to make final inspection upon completion thereof. Failure of the Town and the County to object within 20 days after said final inspection shall indicate satisfactory performance of the contract by the Government.

ARTICLE 7. Release.-

The Town and the County agree on completion of the work provided herein, to accept the new highways and the payment provided for in Article 2 above as full and just compensation for any and all damages and injuries that have been caused or that may be caused to the roads relocated, rearranged, altered and/or discontinued hereunder by reason of the construction and maintenance of the Project by the Government and the flowage easements to be acquired by the Government; and upon final payment as herein provided, the Town and the County agree to and do hereby release the Government from any and all causes of action, suits at law or equity, or claims or demands, or from any liability of any nature whatsoever for and on account of any damages to or interference with the roads of the Town and County and the highways relocated, rearranged, altered, subordinated, and/or discontinued hereunder, or in any way growing out of the construction, operation and maintenance of the Project.

ARTICLE 8. Completion.-

The Government will commence the work hereunder or cause the same to be commenced as soon as possible after the date of this contract and complete the same as expeditiously as possible.

ARTICLE 9. Condemnation.-

Should it be determined for any reason that the right, title and interest of the Town and the County, in and to the land or roads referred to in Article 1 above shall be acquired by condemnation, or other judicial proceedings, the Town and the County shall cooperate in the prosecution of the proceedings and this Agreement shall, without more, constitute a stipulation which may be filed in the proceedings and be final and conclusive evidence of the proper award to be made in such proceedings. In the event this contract is filed in such proceedings, it shall constitute an appearance and waiver of all rights to service or summons or other process, and of the right to appointment of commissioners or a jury to determine the award.

ARTICLE 10. Disputes.-

a. Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof, to the Town and the County. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Town and the County mail or otherwise furnish to the Contracting Officer a written appeal addressed to the Secretary. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final

and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Town and the County shall be afforded an opportunity to be heard and to offer evidence in support of their appeal. Pending final decision of a dispute hereunder, the Town and the County shall proceed diligently with the performance of the Contract and in accordance with the Contracting Officer's decisions.

b. This "Disputes" clause does not preclude consideration of law questions in connection with decisions provided for in paragraph (a) above: Provided; that nothing in this contract shall be construed as making final the decision of any administrative official representative, or board on a question of law.

ARTICLE 11. Covenant Against Contingent Fees.--

The Town and the County warrant that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Town and the County for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage or contingent fee.

ARTICLE 12. Officials Not to Benefit.--

No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. Gratuities.--

a. The Government may, by written notice to the Town and the County, terminate the right of the Town and the County, to proceed under this contract, if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts or otherwise) were offered or given by the Town or County or any agent or representative of the Town or County to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this contract is terminated as provided in Paragraph a. hereof, the Government shall be entitled (1) to pursue the same remedies against the Town and the County as it could pursue in the event of a breach of the contract by the Town and the County and (2) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an

c. The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

a. The term "Secretary" means the Secretary of the Army; the term "Secretary of the Army" or "Head of the Department" as used herein shall have one and the same meaning; and the term "his duly authorized representative" means the Chief of Engineers, Department of the Army, or an individual or board designated by him.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

Name Morris S. Blodgett

Name _____

Walton, Mass
Address

Address

George A. Hashine
Name
Waltham Mass
Address

Name _____

Address

Name Walter J. Foley

Name _____

Springfield, Mass.

Address

By OTTO J. ROHDE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

By _____

OTTO J. ROHDE

Colonel, Corps of Engineers

Deputy Division Engineer

Contracting Officer

TOWN OF MONSON.

By

Chester S. Stoddard
 Thomas W. Hallock
 Albert W. Hurling

BOARD OF SELECTMEN

BOARD OF SELECTMEN

COUNTY OF HAMPDEN

By

William F. Shafer
Thomas F. Sullivan
Palmer P. Walsh

COUNTY COMMISSIONERS

CERTIFICATE

I, Henry Sanderson, do hereby certify that I am the Town Clerk of the Town of Monson, of the Commonwealth of Massachusetts, named herein; that Charles D. Keller, Thomas W. Haley Jr., Arthur W. Lewis, who signed this contract on behalf of the Town of Monson were then and there the duly elected and qualified Selectmen of the Town of Monson, that said contract was duly signed for and on behalf of the Town of Monson by virtue of their authority as Selectmen, and is within the scope of their statutory powers.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the Town of Monson, this 22nd day of January 1968.⁴

Henry Sanderson

Town Clerk

TOWN SEAL

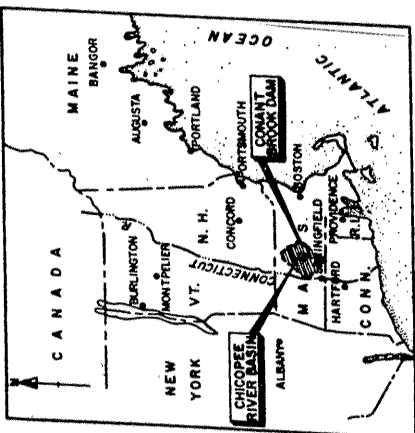
CERTIFICATE

I, Edward G Shea, certify that I am the Clerk of the County Commissioners of the County of Hampden of the Commonwealth of Massachusetts, and that William F. Stapleton, Thomas F. Sullivan, Ralph P. Walsh, who signed this contract on behalf of the County of Hampden of the Commonwealth of Massachusetts were then and there the duly elected and qualified County Commissioners of the County of Hampden of the Commonwealth of Massachusetts; that said contract was duly signed for and on behalf of the County of Hampden and is within the scope of their powers as County Commissioners.

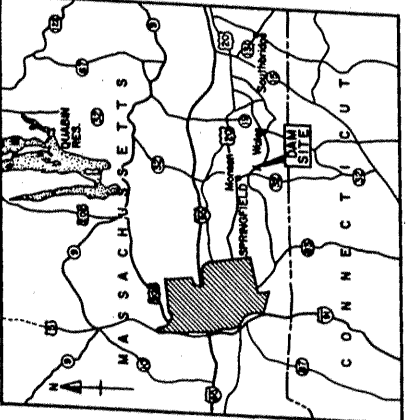
IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the County of Hampden this 29th day of JANUARY 1963⁴.

Edward G. Shea

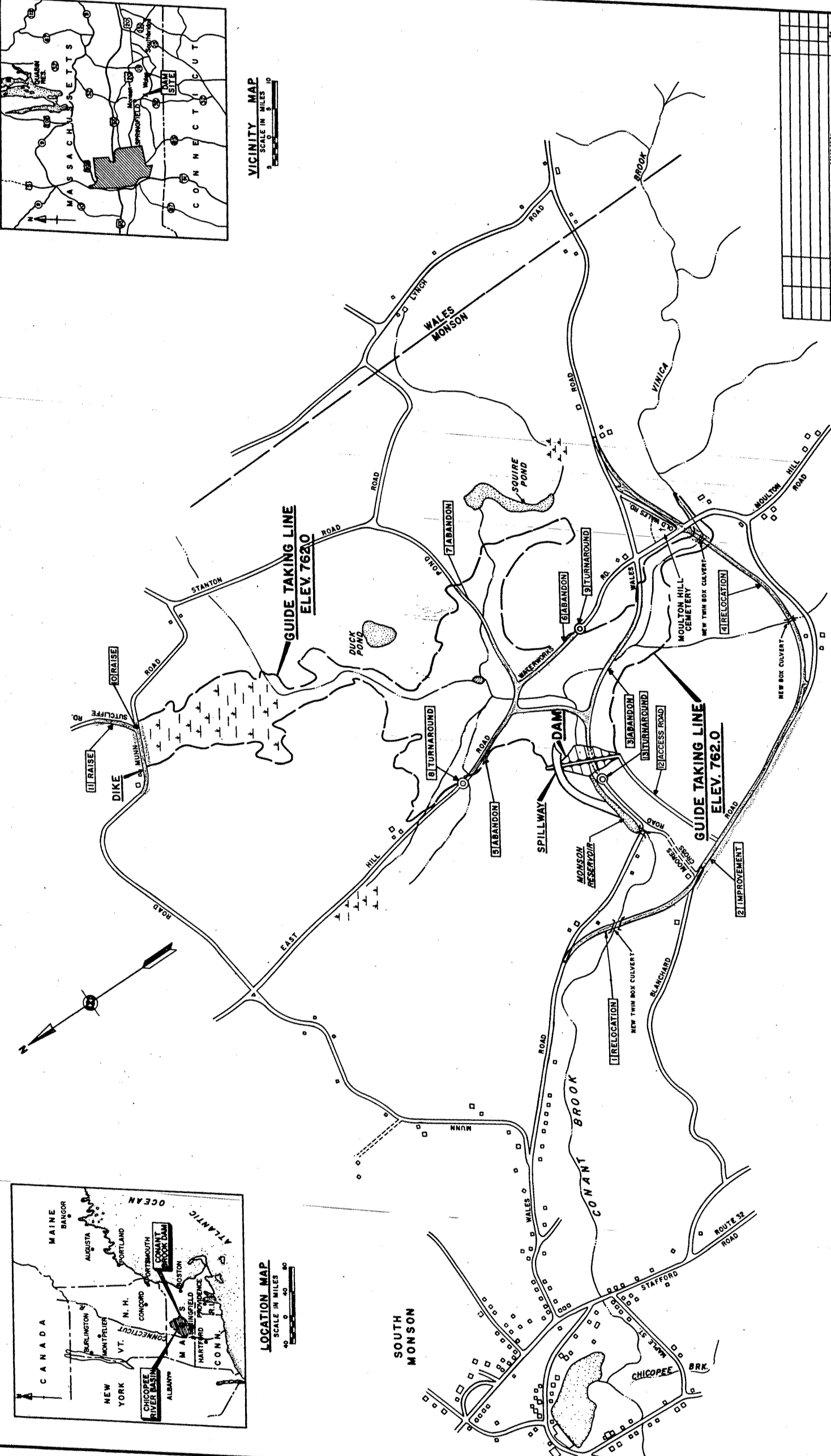
(SEAL)



LOCATION MAP
SCALE IN MILES
0 40 80



VICINITY MAP
SCALE IN MILES
0 40 80



RESERVOIR PLAN
SCALE IN FEET
0 500 1000

- LEGEND
- ROAD TO BE ABANDONED
 - ROAD RELOCATION
 - FLOWAGE EASEMENT
 - ROAD TO BE RAISED
 - ROAD TO BE IMPROVED
 - ACCESS ROAD
 - TURNAROUND

| REVISION | DATE | DESCRIPTION |
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U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CONANT BROOK DAM
CHICOPEE RIVER BASIN
HIGHWAY RELOCATIONS
CHICOPEE RIVER, MASSACHUSETTS
DATE: MARCH 1963
APPROVED BY: [Signature]
SUBMITTED BY: [Signature]
SCALE: AS SHOWN
SHEET NO. 1 OF 1
HC-1-5877

January 24, 1964

U.S. Army Engineer Division, New Eng.
Corps of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Gentlemen:

We hereby confirm the appointment with you for
11:00 A.M. on January 29, 1964, in the County
Commissioners' Office, in Springfield, Mass.

Very truly yours,
HAMPDEN COUNTY COMMISSIONERS

Chairman

WFS:mm

January 29, 1964

U. S. Army Eng. Division N. E.
Corp. of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Att: Morris Phillips, Esq.

Dear Mr. Phillips:

Enclosed please find executed four (4) Agreements: Town of Monson, Mass., County of Hampden, Massachusetts and United States Army concerning Conant Brook Project.

Very truly yours,

Counsel

WJF:mm
encl. (4)

CONTRACT NO. DA-19-016-CIVENG-64- 207

DATE 5 February 1967

CONTRACT FOR RELOCATION, REARRANGEMENT AND/OR ALTERATION
OF FACILITIES

(COST REIMBURSABLE)

Contractor: Town of Monson and County of Hampden,
Massachusetts

Contract For: Relocation, Rearrangement and/or
Alteration of Highway Facilities

Location: Conant Brook Dam and Reservoir Project,
Massachusetts

This contract is authorized by the following law:

Act of Congress Approved 14 July 1960
(Public Law 86-645, 86th Congress, 74 Stat 480)

Appropriation: 96X3122 Construction General
Corps of Engineers, Civil

CONTRACT NO. DA-19-016-CIVENG-64-204

DATE 5 February 1964

CONTRACT WITH TOWN OF MONSON AND COUNTY OF HAMPDEN, MASSACHUSETTS
FOR RELOCATION, REARRANGEMENT, AND/OR ALTERATION OF FACILITIES

(COST REIMBURSABLE)

THIS CONTRACT, entered into this 5th day of February 1964, between the UNITED STATES OF AMERICA (hereinafter called the "GOVERNMENT"), represented by the Contracting Officer executing this contract, and the TOWN OF MONSON, a municipal corporation in the County of Hampden, Commonwealth of Massachusetts, (hereinafter called the "TOWN"), acting by and through its Board of Selectmen, and the COUNTY OF HAMPDEN, also in the Commonwealth of Massachusetts, (hereinafter called the "COUNTY"), acting by and through its County Commissioners.

WITNESSETH, that:

WHEREAS, the Government has under authority of Public Law No. 86-645, 86th Congress (74 Stat. 480), approved July 14, 1960, undertaken the development of a flood control project known as the "Conant Brook Dam and Reservoir Project" (hereinafter called the "PROJECT"); and

WHEREAS, the Town and the County are the holders of certain interests in land, licenses, permits, and statutory authority on which the Town and/or County have constructed and the Town is operating and maintaining certain facilities consisting of highways which interfere with the development and use of the project by the Government; and

WHEREAS, said highway facilities, namely; New Wales Road and a section of Pond Road were originally laid out by the County Commissioners of Hampden County but have been operated and maintained by the Town of Monson as part of its road system for many years; and East Hill Road, Blanchard Road, Water Works Road, the remainder of Pond Road, Sutcliffe Road, Munn Road, Old Wales Road, and Moore's Cross Road were originally laid out by the Town and are operated and maintained by the Town as Town highways; and

WHEREAS, it is necessary in the construction, completion, and enjoyment by the Government of said Project that the aforementioned title, rights, and privileges of the Town and the County be acquired, abandoned, modified and/or restricted, and that said facilities be removed, rearranged and/or altered; and

WHEREAS, the Town and the County are willing to convey, abandon and/or subordinate to the Government all of their right, title and interest in and to said lands and/or rights-of-way and to remove, alter and/or rearrange the said highways in consideration of the payment by the Government of all reasonable and legitimate costs of relocating, rearranging and/or altering said highways and in such a manner as to eliminate interference with construction,

development, use and enjoyment by the Government of said Project; and the Town and the County agree that said consideration constitutes full, just and complete compensation for the acquisition by the Government of the Town's and the County's rights and property; and

WHEREAS, the Town and the County do not desire to perform such work and services hereinafter described in the manner contemplated herein; and

WHEREAS, it has been determined that it is in the best interest of the Government that the Government should make or cause to be made the necessary surveys, plans, specifications and estimates for and incident to the relocation, rearrangement and/or alteration of said highways, and perform or cause to be performed the necessary construction work in connection therewith, and also to acquire the real estate interests needed therefor.

NOW, THEREFORE, in consideration of the faithful performance of each party of the mutual covenants and agreements hereinafter set forth, it is mutually agreed as follows:

ARTICLE 1. Obligations of the Town and the County.-

a. The Town warrants and agrees that East Hill Road, Blanchard Road, Waterworks Road, Sutcliffe Road, Munn Road, a section of Pond Road, Old Wales Road and Moore's Cross Road within or affected by the Conant Brook Dam and Reservoir Area are public highways of the Town of Monson and under the control and jurisdiction of the Town of Monson and its Board of Selectmen; and the Town and the County also warrant and agree that New Wales Road and the remaining section of Pond Road were originally laid out by the County many years ago, that these roads were never discontinued as County highways, and that the Town has been operating and maintaining the same roads as part of the Town's highway system for many years under the control and jurisdiction of its Board of Selectmen.

b. The Town and the County agree to make available to the Government any of the above-mentioned roads for the purpose of constructing and improving the new roads as provided in Article 2 hereafter.

c. The Town and the County agree that they will lay out the relocated New Wales Road including the new connections to New Wales Road, and the Town agrees that it will lay out the rearranged Munn Road and Sutcliffe Road as public highways and upon completion of construction of same, that they will accept them, and that such new sections of roads shall be in full satisfaction for any and all damages and injuries to their systems of roads and highways that have been caused or that may be caused by reason of the construction, maintenance and operation of the Conant Brook Dam and Reservoir Project.

d. The Town, without additional consideration, shall institute and prosecute discontinuation, vacation and abandonment procedures, in accordance with existing State Law for the legal vacation, discontinuance and/or abandonment of approximately 2400 feet of East Hill Road, approximately 675 feet of Pond Road (Town), approximately 1400 feet of Waterworks Road, and the Town and County, without additional consideration, shall institute and prosecute discontinuation, vacation and abandonment procedures, in accordance with existing

State Law for the legal vacation, discontinuance and/or abandonment of approximately 2700 feet of New Wales Road and approximately 825 feet of Pond Road (County within the Conant Brook Dam and Reservoir area, all of which roads are shown delineated in red on plan hereinafter referred to as Exhibit "A", and convey to the Government by good and sufficient deed all of their rights, title, and interest therein, and deliver to the Government releases from all liens and encumbrances on their right, title and interest. The Town and the County further agree to furnish the Government satisfactory evidence that the necessary action has been taken to effect such discontinuance, vacation and abandonment of said roads.

e. The Town and the County further agree, without additional consideration to convey to the Government flowage easement, or assent to the acquisition thereof by condemnation proceeding, or else to subordinate their highway rights to the right of the Government to intermittently flood and overflow all highway slopes, embankments and structures comprising the portion of Munn Road, as shown delineated in green on said Exhibit "A", to elevation 762.0 mean sea level, as may be necessary by reason of operation of the Conant Brook Dam and Reservoir Project.

f. When construction is completed by the Government, the Town and the County will accept a conveyance from the Government of fee simple title and/or easement or right-of-way, subject to the approval of the Secretary of the Army, for the sections of relocated New Wales Road, Sutcliffe Road and for the new connection from relocated New Wales Road to present New Wales Road, and license for the sections of Munn Road and Sutcliffe Road, crossing the dike, in accordance with Article 2 e hereafter.

g. The Town and the County further agree that all costs under this contract will be incurred by the Town and will be processed through the Town only, and all invoices submitted to the Government in payment for such costs will therefore be submitted solely by the Town on its letterhead.

ARTICLE 2. Obligations of the Government.

a. Subject to the availability of funds the Government shall make, or cause to be made, such necessary field investigations, engineering work and surveys and prepare such drawings, schedules, plans, specifications and detailed cost estimates in connection with the road construction work to be performed hereunder, as may be required, all of which shall be subject to the approval of the Town and the County before any work to which they relate is performed. Any drawings, maps or specifications which may be furnished by the Town and the County shall, if required by the Government, be subject to approval by the Contracting Officer before any work to which they relate is performed. No variance or change in the approved plans, drawings, or specifications or in the performance of the work hereunder shall be made without the written approval of the Contracting Officer.

b. Subject to the availability of funds, the Government shall furnish or cause to be furnished all services, labor, materials, tools and equipment necessary to perform the following construction at the places shown and indicated on plan entitled, "Connecticut River Flood Control - Chicopee River Basin - Conant Brook Dam - Highway Relocations - Chicopee River, Massachusetts", dated March 1963.

Drawing Number HC-1-5877, a copy of which is attached hereto and made a part hereof and designated as Exhibit "A";

(1) Construct or cause to be constructed approximately ten thousand one hundred (10,100) feet of a new highway as a replacement for the section of New Wales Road to be abandoned. This new highway will be constructed with twenty-four (24) foot pavement with $2\frac{1}{2}$ inch bituminous concrete over a 12 inch gravel base with 3 foot gravel shoulders on each side. The location of the new roadway is substantially as shown in blue on said Exhibit "A". MultiPlate metal culverts will be constructed over Conant Brook and Vinica Brook.

(2) Construct or cause to be constructed turnarounds, conforming to customary type in the area, at locations where East Hill Road and Waterworks Road enter the Reservoir area, above the Guide Taking Line Elevation 762.0 feet m.s.l. for the Project. A similar turnaround will also be constructed on Wales Road below the Government dam, if required by the Town and County.

(3) Raise or cause to be raised a section of Munn Road about nine hundred and seventy-five (975) feet in length to a minimum elevation of 771.0 feet m.s.l., and widened or cause to be widened to provide a bituminous treated gravel roadway 20 feet wide with 3 foot gravel shoulders on each side, as shown delineated in brown on said Exhibit "A".

(4) Raise or cause to be raised a section of Sutcliffe Road for a distance of approximately two hundred and twenty (220) feet to meet the grade of the section of Munn Road to be raised under (3) above, also as shown delineated in brown on said Exhibit "A". The raised section shall be constructed of gravel eighteen (18) feet wide.

c. Subject to the availability of funds, the Government shall reimburse the Town for all costs expended in connection with the discontinuance, abandonment and vacation of New Wales Road, Pond Road (Town and County Sections), Waterworks Road, and East Hill Road, and for conveyance of flowage rights on Munn Road, as provided in Article 1 hereof including all items of expense properly chargeable thereto, provided that the Government has approved the proposed expenditure therefor, before incurred; labor, materials, transportation, insurance, overhead charges properly allocable to the work, supervision, surveys, permits, rental of tools, equipment and machinery employed in the work, together with such other items of expense (exclusive of profit to the Town and the County) as should, in the opinion of the Contracting Officer be included in the cost of the work. However, the Government will not reimburse for overtime work unless authority to work overtime is obtained from the Contracting Officer or his duly authorized representative prior thereto; provided, however, that no prior approval to work overtime will be required when emergency conditions or other conditions endangering the safety of life or property require that such overtime be performed. The total cost of such work to be performed by the Town and the County under Article 1 hereof is estimated at \$2000. The total cost of the engineering, construction and related work required to be performed by the Government under Article 2 hereof is estimated at \$390,000. The Government shall reimburse the Town when the required work is completed for its costs upon receipt of properly certified invoices, in quadruplicate, supported by such evidence of payment, made by the Town as may be required by the Contracting Officer. All original time cards or

payrolls, material records, and accounts for all charges and expenditures for which reimbursement will be claimed from the Government shall be available at all reasonable times to allow the Government to check and audit the invoices submitted by the Town. So far as practicable, separate records shall be maintained by the Town on all items and accounts which shall constitute the basis of information from which the invoices will be prepared.

d. The Government agrees to acquire all lands, rights of way, easements or other interest in real property necessary for said relocations or alterations of Town and County highways.

e. The Government shall convey to the Town and the County respectively upon completion of construction, subject to the approval of the Secretary of the Army, fee simple title and/or easement or other real estate interests for the sections of the relocated New Wales Road, Munn Road, Sutcliffe Road and the new connection between relocated New Wales Road and present New Wales Road traversing any lands acquired by the Government on which to maintain and operate the relocated highways herein provided for. The Government excepts and reserves from said conveyances or grants, the right to flood all roadway slopes, embankments and structures within the project up to elevation 762.0 feet m.s.l. for operation of said project as shown delineated in green on said Exhibit "A".

ARTICLE 3. Betterments.-

The Town and the County agree that the relocation, rearrangement and/or alteration to be accomplished under this contract will provide the Town and the County with facilities equal in service and utility to those now in existence and that any improvement in design, construction or capacity over and above what is required to provide facilities of equal service and utility shall constitute a betterment and will be furnished by the Town and the County at their own cost and expense; Provided, however, that the term "betterments" will not be deemed to include more costly construction or design necessitated solely as a result of the relocation.

ARTICLE 4. Ownership and Conduct of the Work.-

a. The facilities constructed hereunder shall be the property of the Town and the County. The Town and the County shall be responsible for all materials furnished and work performed by each of them, respectively.

b. The Government may award other contracts for additional or other work in connection with the same project or in the same vicinity. The Town and the County shall conduct operations so as to cooperate fully with any such work being performed by the Government and/or Government contractors and shall carefully fit their own work to that provided under other contracts as directed by the Contracting Officer. The Town and the County shall not commit or permit any act which may interfere with the performance of any such work by the Government and/or any Government contractor.

ARTICLE 5. Interference.-

The Town and the County agree that, so long as the Project is operated or maintained for the purpose as described herein, the facilities as relocated, rearranged, or altered pursuant to this contract shall not be so further altered or modified nor other facilities constructed by the Town and the County so as to interfere with the operation of the Project.

ARTICLE 6. Inspection and Acceptance.--

The Town and the County shall have the right to inspect the work to be performed hereunder at any time during its progress and to make final inspection upon completion thereof. Failure of the Town and the County to object within 20 days after said final inspection shall indicate satisfactory performance of the contract by the Government.

ARTICLE 7. Release.--

The Town and the County agree on completion of the work provided herein, to accept the new highways and the payment provided for in Article 2 above as full and just compensation for any and all damages and injuries that have been caused or that may be caused to the roads relocated, rearranged, altered and/or discontinued hereunder by reason of the construction and maintenance of the Project by the Government and the flowage easements to be acquired by the Government; and upon final payment as herein provided, the Town and the County agree to and do hereby release the Government from any and all causes of action, suits at law or equity, or claims or demands, or from any liability of any nature whatsoever for and on account of any damages to or interference with the roads of the Town and County and the highways relocated, rearranged, altered, subordinated, and/or discontinued hereunder, or in any way growing out of the construction, operation and maintenance of the Project.

ARTICLE 8. Completion.--

The Government will commence the work hereunder or cause the same to be commenced as soon as possible after the date of this contract and complete the same as expeditiously as possible.

ARTICLE 9. Condemnation.--

Should it be determined for any reason that the right, title and interest of the Town and the County, in and to the land or roads referred to in Article 1 above shall be acquired by condemnation, or other judicial proceedings, the Town and the County shall cooperate in the prosecution of the proceedings and this Agreement shall, without more, constitute a stipulation which may be filed in the proceedings and be final and conclusive evidence of the proper award to be made in such proceedings. In the event this contract is filed in such proceedings, it shall constitute an appearance and waiver of all rights to service or summons or other process, and of the right to appointment of commissioners or a jury to determine the award.

ARTICLE 10. Disputes.--

a. Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof, to the Town and the County. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Town and the County mail or otherwise furnish to the Contracting Officer a written appeal addressed to the Secretary. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final

and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Town and the County shall be afforded an opportunity to be heard and to offer evidence in support of their appeal. Pending final decision of a dispute hereunder, the Town and the County shall proceed diligently with the performance of the Contract and in accordance with the Contracting Officer's decisions.

b. This "Disputes" clause does not preclude consideration of law questions in connection with decisions provided for in paragraph (a) above: Provided; that nothing in this contract shall be construed as making final the decision of any administrative official representative, or board on a question of law.

ARTICLE 11. Covenant Against Contingent Fees.-

The Town and the County warrant that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Town and the County for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage or contingent fee.

ARTICLE 12. Officials Not to Benefit.-

No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. Gratuities.-

a. The Government may, by written notice to the Town and the County, terminate the right of the Town and the County, to proceed under this contract, if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts or otherwise) were offered or given by the Town or County or any agent or representative of the Town or County to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this contract is terminated as provided in Paragraph a. hereof, the Government shall be entitled (1) to pursue the same remedies against the Town and the County as it could pursue in the event of a breach of the contract by the Town and the County and (2) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an

amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Town and the County in providing any such gratuities to any such officer or employee.

c. The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

ARTICLE 14. Definitions.-

a. The term "Secretary" means the Secretary of the Army; the term "Secretary of the Army" or "Head of the Department" as used herein shall have one and the same meaning; and the term "his duly authorized representative" means the Chief of Engineers, Department of the Army, or an individual or board designated by him.

b. The term "Contracting Officer" as used herein shall include his duly appointed successor or his authorized representative.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

WITNESSES:

Morris S. Blodgett
Name

Waltham, Mass.
Address

George A. Hashbain
Name

Waltham, Mass.
Address

William J. Foley
Name

Springfield, Mass.
Address

THE UNITED STATES OF AMERICA

By Otto J. Rohde
OTTO J. RONDE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

TOWN OF MONSON

By Phoster J. Stalder
Charles W. Blakey
Albert W. Stacey

BOARD OF SELECTMEN

COUNTY OF HAMPDEN

By William F. Harleton
Thomas F. Sullivan
Ralph P. Walsh

COUNTY COMMISSIONERS

CONTRACT NO. DA-19-016-CIVENG-64-204

DATE 5 February 1964

CONTRACT WITH TOWN OF MONSON AND COUNTY OF HAMPDEN, MASSACHUSETTS
FOR RELOCATION, REARRANGEMENT, AND/OR ALTERATION OF FACILITIES

(COST REIMBURSABLE)

THIS CONTRACT, entered into this 5th day of February 1964, between the UNITED STATES OF AMERICA (hereinafter called the "GOVERNMENT"), represented by the Contracting Officer executing this contract, and the TOWN OF MONSON, a municipal corporation in the County of Hampden, Commonwealth of Massachusetts, (hereinafter called the "TOWN"), acting by and through its Board of Selectmen, and the COUNTY OF HAMPDEN, also in the Commonwealth of Massachusetts, (hereinafter called the "COUNTY"), acting by and through its County Commissioners.

WITNESSETH, that:

WHEREAS, the Government has under authority of Public Law No. 86-645, 86th Congress (74 Stat. 480), approved July 14, 1960, undertaken the development of a flood control project known as the "Conant Brook Dam and Reservoir Project" (hereinafter called the "PROJECT"); and

WHEREAS, the Town and the County are the holders of certain interests in land, licenses, permits, and statutory authority on which the Town and/or County have constructed and the Town is operating and maintaining certain facilities consisting of highways which interfere with the development and use of the project by the Government; and

WHEREAS, said highway facilities, namely; New Wales Road and a section of Pond Road were originally laid out by the County Commissioners of Hampden County but have been operated and maintained by the Town of Monson as part of its road system for many years; and East Hill Road, Blanchard Road, Water Works Road, the remainder of Pond Road, Sutcliffe Road, Munn Road, Old Wales Road, and Moore's Cross Road were originally laid out by the Town and are operated and maintained by the Town as Town highways; and

WHEREAS, it is necessary in the construction, completion, and enjoyment by the Government of said Project that the aforementioned title, rights, and privileges of the Town and the County be acquired, abandoned, modified and/or restricted, and that said facilities be removed, rearranged and/or altered; and

WHEREAS, the Town and the County are willing to convey, abandon and/or subordinate to the Government all of their right, title and interest in and to said lands and/or rights-of-way and to remove, alter and/or rearrange the said highways in consideration of the payment by the Government of all reasonable and legitimate costs of relocating, rearranging and/or altering said highways and in such a manner as to eliminate interference with construction,

development, use and enjoyment by the Government of said Project; and the Town and the County agree that said consideration constitutes full, just and complete compensation for the acquisition by the Government of the Town's and the County's rights and property; and

WHEREAS, the Town and the County do not desire to perform such work and services hereinafter described in the manner contemplated herein; and

WHEREAS, it has been determined that it is in the best interest of the Government that the Government should make or cause to be made the necessary surveys, plans, specifications and estimates for and incident to the relocation, rearrangement and/or alteration of said highways, and perform or cause to be performed the necessary construction work in connection therewith, and also to acquire the real estate interests needed therefor.

NOW, THEREFORE, in consideration of the faithful performance of each party of the mutual covenants and agreements hereinafter set forth, it is mutually agreed as follows:

ARTICLE 1. Obligations of the Town and the County.-

a. The Town warrants and agrees that East Hill Road, Blanchard Road, Waterworks Road, Sutcliffe Road, Munn Road, a section of Pond Road, Old Wales Road and Moore's Cross Road within or affected by the Conant Brook Dam and Reservoir Area are public highways of the Town of Monson and under the control and jurisdiction of the Town of Monson and its Board of Selectmen; and the Town and the County also warrant and agree that New Wales Road and the remaining section of Pond Road were originally laid out by the County many years ago, that these roads were never discontinued as County highways, and that the Town has been operating and maintaining the same roads as part of the Town's highway system for many years under the control and jurisdiction of its Board of Selectmen.

b. The Town and the County agree to make available to the Government any of the above-mentioned roads for the purpose of constructing and improving the new roads as provided in Article 2 hereafter.

c. The Town and the County agree that they will lay out the relocated New Wales Road including the new connections to New Wales Road, and the Town agrees that it will lay out the rearranged Munn Road and Sutcliffe Road as public highways and upon completion of construction of same, that they will accept them, and that such new sections of roads shall be in full satisfaction for any and all damages and injuries to their systems of roads and highways that have been caused or that may be caused by reason of the construction, maintenance and operation of the Conant Brook Dam and Reservoir Project.

d. The Town, without additional consideration, shall institute and prosecute discontinuation, vacation and abandonment procedures, in accordance with existing State Law for the legal vacation, discontinuance and/or abandonment of approximately 2400 feet of East Hill Road, approximately 675 feet of Pond Road (Town), approximately 1400 feet of Waterworks Road, and the Town and County, without additional consideration, shall institute and prosecute discontinuation, vacation and abandonment procedures, in accordance with existing

State Law for the legal vacation, discontinuance and/or abandonment of approximately 2700 feet of New Wales Road and approximately 825 feet of Pond Road (County) within the Conant Brook Dam and Reservoir area, all of which roads are shown delineated in red on plan hereinafter referred to as Exhibit "A", and convey to the Government by good and sufficient deed all of their rights, title, and interest therein, and deliver to the Government releases from all liens and encumbrances on their right, title and interest. The Town and the County further agree to furnish the Government satisfactory evidence that the necessary action has been taken to effect such discontinuance, vacation and abandonment of said roads.

e. The Town and the County further agree, without additional consideration to convey to the Government flowage easement, or assent to the acquisition thereof by condemnation proceeding, or else to subordinate their highway rights to the right of the Government to intermittently flood and overflow all highway slopes, embankments and structures comprising the portion of Munn Road, as shown delineated in green on said Exhibit "A", to elevation 762.0 mean sea level, as may be necessary by reason of operation of the Conant Brook Dam and Reservoir Project.

f. When construction is completed by the Government, the Town and the County will accept a conveyance from the Government of fee simple title and/or easement or right-of-way, subject to the approval of the Secretary of the Army, for the sections of relocated New Wales Road, Sutcliffe Road and for the new connection from relocated New Wales Road to present New Wales Road, and license for the sections of Munn Road and Sutcliffe Road, crossing the dike, in accordance with Article 2 e hereafter.

g. The Town and the County further agree that all costs under this contract will be incurred by the Town and will be processed through the Town only, and all invoices submitted to the Government in payment for such costs will therefore be submitted solely by the Town on its letterhead.

ARTICLE 2. Obligations of the Government.--

a. Subject to the availability of funds the Government shall make, or cause to be made, such necessary field investigations, engineering work and surveys and prepare such drawings, schedules, plans, specifications and detailed cost estimates in connection with the road construction work to be performed hereunder, as may be required, all of which shall be subject to the approval of the Town and the County before any work to which they relate is performed. Any drawings, maps or specifications which may be furnished by the Town and the County shall, if required by the Government, be subject to approval by the Contracting Officer before any work to which they relate is performed. No variance or change in the approved plans, drawings, or specifications or in the performance of the work hereunder shall be made without the written approval of the Contracting Officer.

b. Subject to the availability of funds, the Government shall furnish or cause to be furnished all services, labor, materials, tools and equipment necessary to perform the following construction at the places shown and indicated on plan entitled, "Connecticut River Flood Control - Chicopee River Basin - Conant Brook Dam - Highway Relocations - Chicopee River, Massachusetts", dated March 1963.

Drawing Number HC-1-5877, a copy of which is attached hereto and made a part hereof and designated as Exhibit "A";

(1) Construct or cause to be constructed approximately ten thousand one hundred (10,100) feet of a new highway as a replacement for the section of New Wales Road to be abandoned. This new highway will be constructed with twenty-four (24) foot pavement with $2\frac{1}{2}$ inch bituminous concrete over a 12 inch gravel base with 3 foot gravel shoulders on each side. The location of the new roadway is substantially as shown in blue on said Exhibit "A". MultiPlate metal culverts will be constructed over Conant Brook and Vinica Brook.

(2) Construct or cause to be constructed turnarounds, conforming to customary type in the area, at locations where East Hill Road and Waterworks Road enter the Reservoir area, above the Guide Taking Line Elevation 762.0 feet m.s.l. for the Project. A similar turnaround will also be constructed on Wales Road below the Government dam, if required by the Town and County.

(3) Raise or cause to be raised a section of Munn Road about nine hundred and seventy-five (975) feet in length to a minimum elevation of 771.0 feet m.s.l., and widened or cause to be widened to provide a bituminous treated gravel roadway 20 feet wide with 3 foot gravel shoulders on each side, as shown delineated in brown on said Exhibit "A".

(4) Raise or cause to be raised a section of Sutcliffe Road for a distance of approximately two hundred and twenty (220) feet to meet the grade of the section of Munn Road to be raised under (3) above, also as shown delineated in brown on said Exhibit "A". The raised section shall be constructed of gravel eighteen (18) feet wide.

c. Subject to the availability of funds, the Government shall reimburse the Town for all costs expended in connection with the discontinuance, abandonment and vacation of New Wales Road, Pond Road (Town and County Sections), Waterworks Road, and East Hill Road, and for conveyance of flowage rights on Munn Road, as provided in Article 1 hereof including all items of expense properly chargeable thereto, provided that the Government has approved the proposed expenditure therefor, before incurred; labor, materials, transportation, insurance, overhead charges properly allocable to the work, supervision, surveys, permits, rental of tools, equipment and machinery employed in the work, together with such other items of expense (exclusive of profit to the Town and the County) as should, in the opinion of the Contracting Officer be included in the cost of the work. However, the Government will not reimburse for overtime work unless authority to work overtime is obtained from the Contracting Officer or his duly authorized representative prior thereto; provided, however, that no prior approval to work overtime will be required when emergency conditions or other conditions endangering the safety of life or property require that such overtime be performed. The total cost of such work to be performed by the Town and the County under Article 1 hereof is estimated at \$2000. The total cost of the engineering, construction and related work required to be performed by the Government under Article 2 hereof is estimated at \$390,000. The Government shall reimburse the Town when the required work is completed for its costs upon receipt of properly certified invoices, in quadruplicate, supported by such evidence of payment, made by the Town as may be required by the Contracting Officer. All original time cards or

payrolls, material records, and accounts for all charges and expenditures for which reimbursement will be claimed from the Government shall be available at all reasonable times to allow the Government to check and audit the invoices submitted by the Town. So far as practicable, separate records shall be maintained by the Town on all items and accounts which shall constitute the basis of information from which the invoices will be prepared.

d. The Government agrees to acquire all lands, rights of way, easements or other interest in real property necessary for said relocations or alterations of Town and County highways.

e. The Government shall convey to the Town and the County respectively upon completion of construction, subject to the approval of the Secretary of the Army, fee simple title and/or easement or other real estate interests for the sections of the relocated New Wales Road, Munn Road, Sutcliffe Road and the new connection between relocated New Wales Road and present New Wales Road traversing any lands acquired by the Government on which to maintain and operate the relocated highways herein provided for. The Government excepts and reserves from said conveyances or grants, the right to flood all roadway slopes, embankments and structures within the project up to elevation 762.0 feet m.s.l. for operation of said project as shown delineated in green on said Exhibit "A".

ARTICLE 3. Betterments.-

The Town and the County agree that the relocation, rearrangement and/or alteration to be accomplished under this contract will provide the Town and the County with facilities equal in service and utility to those now in existence and that any improvement in design, construction or capacity over and above what is required to provide facilities of equal service and utility shall constitute a betterment and will be furnished by the Town and the County at their own cost and expense; Provided, however, that the term "betterments" will not be deemed to include more costly construction or design necessitated solely as a result of the relocation.

ARTICLE 4. Ownership and Conduct of the Work.-

a. The facilities constructed hereunder shall be the property of the Town and the County. The Town and the County shall be responsible for all materials furnished and work performed by each of them, respectively.

b. The Government may award other contracts for additional or other work in connection with the same project or in the same vicinity. The Town and the County shall conduct operations so as to cooperate fully with any such work being performed by the Government and/or Government contractors and shall carefully fit their own work to that provided under other contracts as directed by the Contracting Officer. The Town and the County shall not commit or permit any act which may interfere with the performance of any such work by the Government and/or any Government contractor.

ARTICLE 5. Interference.-

The Town and the County agree that, so long as the Project is operated or maintained for the purpose as described herein, the facilities as relocated, rearranged, or altered pursuant to this contract shall not be so further altered or modified nor other facilities constructed by the Town and the County so as to interfere with the operation of the Project.

ARTICLE 6. Inspection and Acceptance.-

The Town and the County shall have the right to inspect the work to be performed hereunder at any time during its progress and to make final inspection upon completion thereof. Failure of the Town and the County to object within 20 days after said final inspection shall indicate satisfactory performance of the contract by the Government.

ARTICLE 7. Release.-

The Town and the County agree on completion of the work provided herein, to accept the new highways and the payment provided for in Article 2 above as full and just compensation for any and all damages and injuries that have been caused or that may be caused to the roads relocated, rearranged, altered and/or discontinued hereunder by reason of the construction and maintenance of the Project by the Government and the flowage easements to be acquired by the Government; and upon final payment as herein provided, the Town and the County agree to and do hereby release the Government from any and all causes of action, suits at law or equity, or claims or demands, or from any liability of any nature whatsoever for and on account of any damages to or interference with the roads of the Town and County and the highways relocated, rearranged, altered, subordinated, and/or discontinued hereunder, or in any way growing out of the construction, operation and maintenance of the Project.

ARTICLE 8. Completion.-

The Government will commence the work hereunder or cause the same to be commenced as soon as possible after the date of this contract and complete the same as expeditiously as possible.

ARTICLE 9. Condemnation.-

Should it be determined for any reason that the right, title and interest of the Town and the County, in and to the land or roads referred to in Article 1 above shall be acquired by condemnation, or other judicial proceedings, the Town and the County shall cooperate in the prosecution of the proceedings and this Agreement shall, without more, constitute a stipulation which may be filed in the proceedings and be final and conclusive evidence of the proper award to be made in such proceedings. In the event this contract is filed in such proceedings, it shall constitute an appearance and waiver of all rights to service or summons or other process, and of the right to appointment of commissioners or a jury to determine the award.

ARTICLE 10. Disputes.-

a. Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof, to the Town and the County. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Town and the County mail or otherwise furnish to the Contracting Officer a written appeal addressed to the Secretary. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final.

and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Town and the County shall be afforded an opportunity to be heard and to offer evidence in support of their appeal. Pending final decision of a dispute hereunder, the Town and the County shall proceed diligently with the performance of the Contract and in accordance with the Contracting Officer's decisions.

b. This "Disputes" clause does not preclude consideration of law questions in connection with decisions provided for in paragraph (a) above; provided; that nothing in this contract shall be construed as making final the decision of any administrative official representative, or board on a question of law.

ARTICLE 11. Covenant Against Contingent Fees.-

The Town and the County warrant that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Town and the County for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage or contingent fee,

ARTICLE 12. Officials Not to Benefit.-

No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. Gratuities.-

a. The Government may, by written notice to the Town and the County, terminate the right of the Town and the County, to proceed under this contract, if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts or otherwise) were offered or given by the Town or County or any agent or representative of the Town or County to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this contract is terminated as provided in Paragraph a. hereof, the Government shall be entitled (1) to pursue the same remedies against the Town and the County as it could pursue in the event of a breach of the contract by the Town and the County and (2) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an

amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Town and the County in providing any such gratuities to any such officer or employee.

c. The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

ARTICLE 14. Definitions.

a. The term "Secretary" means the Secretary of the Army; the term "Secretary of the Army" or "Head of the Department" as used herein shall have one and the same meaning; and the term "his duly authorized representative" means the Chief of Engineers, Department of the Army, or an individual or board designated by him.

b. The term "Contracting Officer" as used herein shall include his duly appointed successor or his authorized representative.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

WITNESSES:

Morris S. Phelps
Name

Waltham, Mass.
Address

George A. Hartman
Name

Waltham, Mass.
Address

Walter J. Foley
Name

Springfield, Mass.
Address

THE UNITED STATES OF AMERICA

By Otto J. Rohde
OTTO J. ROHDE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

TOWN OF MONSON

By Robert S. Halden
Thomas W. Halden
Walter J. Foley

BOARD OF SELECTMEN

COUNTY OF HAMPDEN

By William J. Harbison
Thomas W. Sullivan
Ralph P. Walsh

COUNTY COMMISSIONERS

CERTIFICATE

I, Henry Sanderson, do hereby certify that I am the
Town Clerk of the Town of Monson, of the Commonwealth of Massachusetts,
named herein; that Chester K. Holten, Thomas W. Haly Jr.,
Arthur W. Lewis, who signed this contract on behalf of the Town
of Monson were then and there the duly elected and qualified Selectmen of
the Town of Monson, that said contract was duly signed for and on behalf of
the Town of Monson by virtue of their authority as Selectmen, and is within
the scope of their statutory powers.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the
Town of Monson, this 22d day of January 1965

Henry Sanderson

Town Clerk

TOWN SEAL

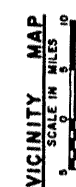
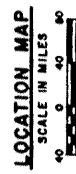
CERTIFICATE

I, Edward G. Shea, certify that I am the Clerk of the County Commissioners of the County of Hampden of the Commonwealth of Massachusetts, and that William F. Stapleton, Thomas F. Sullivan, Ralph P. Walsh, who signed this contract on behalf of the County of Hampden of the Commonwealth of Massachusetts were then and there the duly elected and qualified County Commissioners of the County of Hampden of the Commonwealth of Massachusetts; that said contract was duly signed for and on behalf of the County of Hampden and is within the scope of their powers as County Commissioners.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the County of Hampden this 29th day of January 1968.

Edward G. Shea

(SEAL)

[illegible]

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54, MASS. 02154

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.
NEDRE

10 February 1964

Mr. William F. Stapleton, Chairman
Hampden County Commissioners
37 Allen Street
Springfield, Massachusetts

Dear Mr. Stapleton:

A public meeting under the sponsorship of the Water Resources Commission, Commonwealth of Massachusetts, will be held on February 26, 1964, at 7:30 P.M., in the Town Hall, Monson, Massachusetts, in connection with land acquisition for the construction of the Conant Brook Dam and Reservoir. I am inclosing copies of the Public Notice bearing a release date of February 13, 1964.

The purpose of this meeting is to inform landowners and others in attendance of Government procedures and policies in general with respect to land acquisition, relocations and engineering features of the project.

Should you plan to attend or be represented, I would appreciate being informed in advance.

Sincerely yours,



P. C. HYZER
Brigadier General, USA
Division Engineer

1 Incl
Public Notice (in trip)

WEDRE-A

13 February 1964

SUBJECT: Designation as Authorized Representative of the Contracting Officer in connection with Contract No. DA-19-016-CIVENG64-204

TO: Mr. D. H. Steinhoff
Area Engineer
U.S. Army Engineer Division, NE
Westfield Area
Massachusetts State Armory
137 Franklin Street
Westfield, Massachusetts

1. Pursuant to the provisions of ECI 1-451, ER 1180-1-1, you are hereby designated as my authorized representative to approve invoices submitted by the Town and County for provisional payment under Contract No. DA-19-016-CIVENG-64-204 dated 5 February 1964 entered into between the Town of Monson and County of Hampden, Massachusetts and the United States of America for the relocation, rearrangement and/or alteration of highway facilities in connection with the Conant Brook Dam and Reservoir Project.

2. Two (2) copies of said contract are transmitted herewith.

3. It is your future responsibility to keep adequate records and to insure protection in the interest of the Government.

1 Incl
as

OTTO J. ROHDE
Colonel, Corps of Engineers
Deputy Division Engineer
Contracting Officer

✓ cc: County Commissioners
County of Hampden

NEDRE-A

13 February 1964

Board of Selectmen
Town Hall
Monson, Massachusetts

✓ Hampden County Commissioners
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Re: Conant Brook Dam & Reservoir Project,
Town of Monson and County of Hampden

Transmitted herewith is an executed copy of Contract No.
DA-19-016-CIVENG-64-204 dated 5 February 1964, between the Govern-
ment and the Town of Monson and County of Hampden, Massachusetts for
relocation, rearrangement and/or alteration of highway facilities
in connection with the Conant Brook Dam and Reservoir Project.

Sincerely yours,

1 Incl
as

J. M. GEOGHEGAN
Chief, Real Estate Division

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS 02154

13 February 1964

PUBLIC NOTICE

A public meeting, sponsored by the Water Resources Commission, Commonwealth of Massachusetts, regarding the land acquisition for the Conant Brook Flood Control Project will be held at the Town Hall, Monson, Massachusetts, on Wednesday evening, February 26, 1964, at 7:30 P.M.

The purpose of the meeting is to inform landowners of Government procedures and policies with respect to the acquisition of land. Other pertinent information on engineering features of the project, including relocations, will also be explained.

As the meeting is of a general nature only, it is not intended that individual problems will be discussed. Each individual case of acquisition will be treated separately at the appropriate time after a detailed study of factors related to the individual case has been made.

P. C. HYZER
Brigadier General, USA
Division Engineer

Inc. 11

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS 02154

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P. C. HYZER
Brigadier General, USA
Division Engineer

Inf, 2

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS 02154

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P. C. HYZER
Brigadier General, USA
Division Engineer

Inc 13

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54, MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDED-D

2 April 1964

Mr. William F. Stapleton, Chairman
Hampden County Commissioners
County Courthouse
Springfield, Massachusetts


Dear Mr. Stapleton:

The Conant Brook Dam, highway relocations and appurtenant structures have been advertised for bids today and bids will be received on May 7, 1964.

I am pleased to forward herewith, for your information, one complete set of the contract drawings and specifications.

It will be greatly appreciated if you will review the contract drawings for the highway relocations and advise me as soon as possible if they meet with your approval.

Sincerely yours,


JOHN Wm. LESLIE
Chief, Engineering Division

1 Incl
Set of Plans & Specs

B7C

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54, MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDED-D

11 May 1964

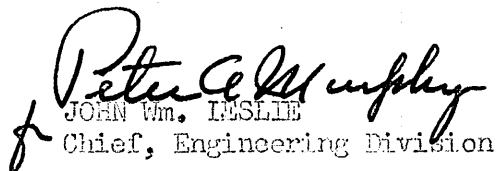
Mr. William F. Stapleton, Chairman
Hampden County Commissioners
County Courthouse
Springfield, Massachusetts

Dear Mr. Stapleton:

On 2 April 1964 a set of the contract drawings and specifications for the relocation of Wales Road on the Conant Brook Dam and Reservoir Project was forwarded to you for approval in accordance with the contract which was executed jointly by your Commission and the Selectmen of Monson, Massachusetts. At the same time, a set of contract drawings and specifications was sent to the Selectmen of Monson for their approval which was received in a letter from them dated 30 April 1964.

Bids were opened on 7 May 1964 and it is expected that a contract will be awarded for the construction of Wales Road relocation in the near future. We would appreciate very much receiving your approval of the contract drawings and specifications as soon as possible.

Sincerely yours,


JOHN Wm. LESLIE
Chief, Engineering Division

May 13, 1964.

Mr. John Wm. Leslie
Chief, Engineering Division
U.S. Army Engineer Division, New England
424 Trapelo Road
Waltham 54, Massachusetts

Dear Mr. Leslie: RE: NEDED-D

This will acknowledge receipt of your letter dated May 11, 1964, relative to contract drawings and specifications for the relocation of Wales Road on the Conant River in Monson, Massachusetts (Conant Brook Dam and Reservoir Project).

The County Commissioners of Hampden County approve of the contract drawings and specifications for the relocation of Wales Road.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____
Counsel.

WJF:F



U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS. 02154

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.
NEDRE-A

14 April 1966

William J. Foley, Esq.
Counsel
Hampden County Commissioners
52 State Street
Springfield, Massachusetts

Dear Mr. Foley:

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-64-204

It is my understanding that construction of the relocated roads is completed. Under the terms of the subject relocation agreement, the Town of Monson and the County must abandon certain public roads within the Project. The County roads are approximately 2,700 feet of new Wales Road and approximately 825 feet of Pond Road.

Inasmuch as a section of Wales Road is owned in fee simple by the County, I am inclosing proposed Quitclaim Deed for execution by the County Commissioners if satisfactory. That road has been designated as Tract No. 216 of the Project.

By separate correspondence the Town of Monson is being requested to fulfill the remaining requirements of the subject contract; namely, the discontinuance of its highways within the Project, subordinating other highway rights to the Government rights to flood, and the layout and the acceptance of the new roads. We are presently preparing Outgrant Deeds by the Government, and will shortly submit drafts for approval by you and the Town Counsel before execution.

I would appreciate your early attention to the discontinuance of the two County highways and execution and return of the inclosed Deed.

Sincerely yours,

MORRIS S. PHILLIPS
Acting Chief, Real Estate Division

1 Incl
as



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDED-T

7 November 1966

County Commissioners
Hampden County
Court House
Springfield, Massachusetts

RE: Littleville Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-62-290

Gentlemen:

Additional funds in the amount of \$91.12 have been obligated for work to be performed by the Town and County under Contract No. DA-19-016-CIVENG-62-290 for road relocations on the Littleville Dam and Reservoir Project, making a total obligation to date of \$537,091.12.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "W. R. Savoldi", is written over the typed name.

W. R. SAVOLDI
Major, Corps of Engineers
Assistant Division Engineer
Contracting Officer

KNOW ALL MEN BY THESE PRESENTS

That the COUNTY OF HAMPDEN, legally organized and existing under the laws of the Commonwealth of Massachusetts acting by and through its Commissioners, hereunto duly authorized in consideration of ONE DOLLAR (\$1.00) paid by the United States of America, grants to the UNITED STATES OF AMERICA and its assigns with QUITCLAIM COVENANTS, a certain parcel of land in the Town of Monson, County of Hampden, Commonwealth of Massachusetts, bounded and described as follows:

✓ A certain tract of land sixty and no hundredths (60.00) feet wide constituting part of Wales Road, so-called, in the southerly part of the Town of Monson, County of Hampden, in the Commonwealth of Massachusetts, and more particularly bounded and described as follows:

Beginning at a concrete bound marked "H-C-H" in the southerly sideline of said Wales Road opposite Station 79+06.14 on the centerline of the 1936 County Commissioners layout; said beginning point having coordinates in the Massachusetts Plane Coordinate System, Mainland Zone of E 384,452.88, N 391,963.42 and being southeasterly a distance of about two hundred and twenty and no hundredths (220.00) feet from the center of the Town Water Department dam on Conant Brook, so-called;

thence N 18°27'25" W a distance of sixty and no hundredths (60.00) feet across the said Wales Road to an iron pipe;

thence easterly and southeasterly a distance of about thirty-two hundred thirty-four and no hundredths (3234.00) feet along the northerly and northeasterly sideline of said Wales Road along land of the Town of Monson, land of Evelyn S. Shaw, other land of the Town of Monson, and land of Richard S. Sutcliffe to an iron pipe;

thence S 57°57'08" E a distance of one hundred eighty-six and twenty-seven hundredths (186.27) feet along the said northeasterly sideline of Wales Road along said land of Richard S. Sutcliffe to an iron pipe;

thence S 32°02'52" W a distance of sixty and no hundredths (60.00) feet across said Wales Road to an iron pipe;

thence northwesterly and westerly a distance of about three thousand three hundred sixty-eight and no hundredths (3368.00) feet along the southwesterly and southerly sideline of said Wales Road along land of Richard S. Sutcliffe, land of Wilford F. Plumley and land of Arthur C. North to the point of beginning;

containing 4.67 acres more or less;

being part of the road acquired and laid out by the Commissioners of Hampden County on October 24, 1934 and November 18, 1936, and all of the road acquired and laid out by the Commissioners of Hampden County on October 9, 1935, and recorded in Hampden County Registry of Deeds in Book 1581 Page 466, Book 1610 Page 362, and Book 1628 Page 456.

The above estate is subject to existing easements for public utilities, for railroads and pipelines.

This conveyance is made pursuant to the terms and conditions of Contract No. DA-19-016-64-204 dated 5 February 1964 between the parties hereto.

Doc 21

CERTIFICATE

I, Henry C. Sanders do hereby certify that I am the
Town Clerk of the Town of Monson, of the Commonwealth of Massachusetts,
named herein; that Chester W. Alden, Thomas W. Haley, Jr.,
Albert W. Buring, who signed this contract on behalf of the Town
of Monson were then and there the duly elected and qualified Selectmen of
the Town of Monson, that said contract was duly signed for and on behalf of
the Town of Monson by virtue of their authority as Selectmen, and is within
the scope of their statutory powers.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the
Town of Monson, this 22nd day of January 1964.

Henry C. Sanders
Town Clerk

TOWN SEAL

IN WITNESS WHEREOF, the said County of Hampden has caused these presents to be signed and its corporate seal hereunto affixed by _____ and _____ its Commissioners thereunto duly authorized this _____ day of _____ 1966.

Signed, Sealed and Delivered
in the presence of:

COUNTY OF HAMPDEN

BY _____ (SEAL)

_____ (SEAL)

_____ (SEAL)

Its COUNTY COMMISSIONERS

COMMONWEALTH OF MASSACHUSETTS

Hampden, ss.

Then personally appeared the above named _____, _____ and _____, Commissioners of Hampden County of the County of Hampden, Massachusetts and acknowledged the foregoing instrument to be their free act and deed and the free act and deed of the County of Hampden, before me,

Notary Public

My commission expires _____ (NOTARIAL SEAL)

NEDRE-A

14 April 1966

William J. Foley, Esq.
Counsel
Hampden County Commissioners
52 State Street
Springfield, Massachusetts

Dear Mr. Foley:

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-GIVENS-64-204

It is my understanding that construction of the relocated roads is completed. Under the terms of the subject relocation agreement, the Town of Monson and the County must abandon certain public roads within the Project. The County roads are approximately 2,700 feet of new Wales Road and approximately 825 feet of Pond Road.

Inasmuch as a section of Wales Road is owned in fee simple by the County, I am inclosing proposed Quitclaim Deed for execution by the County Commissioners if satisfactory. That road has been designated as Tract No. 216 of the Project.

By separate correspondence the Town of Monson is being requested to fulfill the remaining requirements of the subject contract; namely, the discontinuance of its highways within the Project, subordinating other highway rights to the Government rights to flood, and the layout and the acceptance of the new roads. We are presently preparing Outgrant Deeds by the Government, and will shortly submit drafts for approval by you and the Town Counsel before execution.

I would appreciate your early attention to the discontinuance of the two County highways and execution and return of the inclosed Deed.

Sincerely yours,

1 Incl
as

MORRIS S. PHILLIPS
Acting Chief, Real Estate Division

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A certain tract of land sixty and no hundredths (60.00) feet wide constituting part of Wales Road, so-called, in the southerly part of the Town of Monson, County of Hampden, in the Commonwealth of Massachusetts, and more particularly bounded and described as follows:

Beginning at a concrete bound marked "H-C-H" in the southerly sideline of said Wales Road opposite Station 79+06.14 on the centerline of the 1936 County Commissioners layout; said beginning point having coordinates in the Massachusetts Plane Coordinate System, Mainland Zone of E 384,452.88, N 391,963.42 and being southeasterly a distance of about two hundred and twenty and no hundredths (220.00) feet from the center of the Town Water Department dam on Conant Brook, so-called;

thence N 18°27'25" W a distance of sixty and no hundredths (60.00) feet across the said Wales Road to an iron pipe;

thence easterly and southeasterly a distance of about thirty-two hundred thirty-four and no hundredths (3234.00) feet along the northerly and northeasterly sideline of said Wales Road along land of the Town of Monson, land of Evelyn S. Shaw, other land of the Town of Monson, and land of Richard S. Sutcliffe to an iron pipe;

thence S 57°57'08" E a distance of one hundred eighty-six and twenty-seven hundredths (186.27) feet along the said northeasterly sideline of Wales Road along said land of Richard S. Sutcliffe to an iron pipe;

thence S 32°02'52" W a distance of sixty and no hundredths (60.00) feet across said Wales Road to an iron pipe;

thence northwesterly and westerly a distance of about three thousand three hundred sixty-eight and no hundredths (3368.00) feet along the southwesterly and southerly sideline of said Wales Road along land of Richard S. Sutcliffe, land of Wilford F. Plumley and land of Arthur C. North to the point of beginning;

containing 4.67 acres more or less;

being part of the road acquired and laid out by the Commissioners of Hampden County on October 24, 1934 and November 18, 1936, and all of the road acquired and laid out by the Commissioners of Hampden County on October 9, 1935, and recorded in Hampden County Registry of Deeds in Book 1581 Page 466, Book 1610 Page 362, and Book 1628 Page 456.

The above estate is subject to existing easements for public utilities, for railroads and pipelines.

This conveyance is made pursuant to the terms and conditions of Contract No. DA-19-016-64-204 dated 5 February 1964 between the parties hereto.

IN WITNESS WHEREOF, the said County of Hampden has caused these presents to be signed and its corporate seal hereunto affixed by it _____, _____ and _____ its Commissioners thereunto duly authorized this _____ day of _____ 1966.

Signed, Sealed and Delivered
in the presence of:

COUNTY OF HAMPDEN

BY _____ (SEAL)

_____ (SEAL)

_____ (SEAL)

Its COUNTY COMMISSIONERS

COMMONWEALTH OF MASSACHUSETTS

Hampden, ss.

Then personally appeared the above named _____, _____ and _____, Commissioners of Hampden County of the County of Hampden, Massachusetts and acknowledged the foregoing instrument to be their free act and deed and the free act and deed of the County of Hampden, before me,

Notary Public

My commission expires _____ (NOTARIAL SEAL)



Commonwealth of Massachusetts

COPY

Office of the
County Commissioners
52 State Street

County of Hampden

William F. Stapleton
Chairman

Ralph H. Walsh
Lloyd W. Fradet

Springfield, Mass.

October 16, 1968

Department of the Army,
New England Division,
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Attn: Real Estate Division

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that the dam and dike located in Monson and upstream of the new Conant Brook Flood Control Dam and formerly the property of R.S. Sutcliffe, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is now in very poor condition, it is quite dilapidated and the structure is failing to the left of the spillway where overflowing water has eaten into the dam. The dam must be repaired or the washout will become larger with each flood flow condition and eventually the entire pond will be released.

All large trees growing from the vicinity of the spillway and the dam embankment should be cut down.

The dike at the opposite end of the pond from the dam is in need of maintenance and attention. Large trees growing from the dike should be cut down.

There has been little or no maintenance at this dam during the past 5 or 6 years. With each passing inspection it has been noted that the dam is becoming more dilapidated. The time has now arrived wherein the dam must be repaired or it will be lost.

COPY

The office of the Corps of Engineers at Trapelo St. in Waltham should be notified of the condition of this dam."

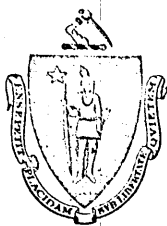
It is the understanding of the County Hydraulic Engineer that the dam and dike are now Government property. This property should be properly maintained or the structure should be breached in such a way that flood flows can safely pass without impounding any water.

Will you kindly take whatever action is necessary to properly repair and maintain the dam and the dike or breach each structure with an opening deep enough and wide enough to pass anticipated flood flow run-off.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



Commonwealth of Massachusetts

COPY

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph H. Walsh
Floyd W. Fradet

October 16, 1968

Mr. Leonard M. Meurisse
Stafford Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located at Smith Pond on Stafford Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The dike at this pond was in fair condition. The masonry of the headworks at the drain gate is spalled but satisfactory. The toe of the dike at the location of the breach which occurred in 1955 is wet but there is no movement to this water. The stone masonry wall forming the downstream face of much of the dike and situated to the right of the old breach was in satisfactory condition.

At the main dam, the earth embankment to the right of the spillway has become overgrown with brush and trees. All brush and tree growth occurring on the earth embankment should be cut down.

The spillway is in fair condition. The cemented boulder crest is becoming dilapidated but its loss and leakage at the crest will result in increasing the safety of the dam. There were no flashboards on the crest at the time of inspection and water in storage was overflowing the spillway crest.

The stone masonry of the basic dam was in fair condition. The toe area was satisfactory. There is some earth erosion occurring downstream of the dam spillway just to the left side of the spillway crest.

COPY

-2-

Further erosion could be prevented by filling this area with heavy broken or field stone or by constructing a small and short training wall at the left end of the spillway.

It is recommended that the owner of the dam be advised of the necessary maintenance work. "

The contents of the report are self-explanatory and it would be advisable to follow the recommendations of the County Hydraulic Engineer in order to protect the investment you have in the dam.

If by chance you are not the owner of this dam and our records are in error, please notify us of the name and address of the owner.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:
NEDED-T

5 December 1968

Hampden County Commission
Hampden County Court House
State Street
Springfield, Massachusetts 01103

Gentlemen:

We are forwarding, under separate cover, the original drawings used in the construction of the Relocation of Wales Road, Conant Brook Dam, since this road is under the jurisdiction of the County Commission.

These drawings have been stamped "As-Built" as they are considered official documents and have been microfilmed and placed in our files for record purposes.

Sincerely yours,

54 Incl (Set of Originals)
(Set of Prints)

1.-51. Dwg. CON-9, Shs. 1 thru

51

52.-54. " " Shs. 60 thru 62

John Wm. Leslie
JOHN Wm. LESLIE
Chief, Engineering Division



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:
NEDOD-R

10 December 1968

County of Hampden
Office of the County Commissioners
52 State Street
Springfield, Massachusetts 01103

Dear Sirs:

Reference is made to your letter dated 16 October 1968 advising us of the condition of the dam and dike at Conant Brook Reservoir on land formerly owned by Mr. R. S. Sutcliffe.

Your request for action to repair these structures was referred to me since our office is responsible for the maintenance of all flood control reservoirs in New England which are under the jurisdiction of the Corps of Engineers.

This is to inform you that our field personnel have made temporary repairs to the dam by replacing material which was washed out previously and by cutting and removing the growth along the structures. Permanent corrective action will be delayed pending completion of a review to determine whether there is a need to retain these structures.

Thank you for bringing this matter to our attention.

Sincerely yours,


F. W. FOGARTY
Chief, Operations Division

CERTIFICATE

I, EDWARD G. SHEA, certify that I am the Clerk of the County Commissioners of the County of Hampden of the Commonwealth of Massachusetts, and that William F. Stapleton, Thomas F. Sullivan, Ralph P. Walsh, who signed this contract on behalf of the County of Hampden of the Commonwealth of Massachusetts were then and there the duly elected and qualified County Commissioners of the County of Hampden of the Commonwealth of Massachusetts; that said contract was duly signed for and on behalf of the County of Hampden and is within the scope of their powers as County Commissioners.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the County of Hampden this 29th day of JANUARY 1968. ⁴

Edward G. Shea

(SEAL)

December 17, 1968

Mr. George H. McDonnell
Tighe & Bond
Bowers & Pequot Sts.
Holyoke, Massachusetts 01040

Dear Mr. McDonnell:

The enclosed copy of a letter from the
Department of the Army is being sent to you for
your information.

Any suggestions you may care to make to
the County Commissioners will be acceptable.

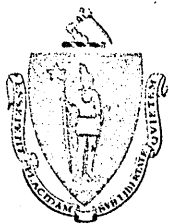
Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____
County Counsel.

WJF:F

Enc.



Commonwealth of Massachusetts

COPY

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph H. Walsh
Floyd W. Fradet

May 21, 1969

Board of Water Commissioners
Monson Water Department
Town Office Annex
Monson, Massachusetts

Re: Conant Brook Reservoir Dam

Gentlemen:

The County Hydraulic Engineer has made an inspection of your dam on Conant Brook for the purpose of observing saturated soil downstream of the dam and behind the right concrete masonry training wall and extends downstream from the dam and forms the right side of the brook channel.

The report of the inspection indicates that the soil behind the right training wall and downstream of the right abutment of the dam is quite wet. There is also evidence of leakage through the stone masonry of the dam in the right abutment area where the stone masonry is exposed to view. In the opinion of the County Hydraulic Engineer, this seepage condition is normal for the type and age of dam involved.

The wet condition of the soil in the right abutment downstream area should be observed frequently to note any change in the condition. If the extreme wet spring weather has contributed to the wet soil, then the condition should subside as dry summer weather is experienced. If the condition is directly related to seepage through the dam and if the seepage increases, the wet condition will probably persist and may become of concern. Should this happen, then the water level behind the dam should be lowered slowly for the purpose of relieving pressure, reducing seepage and determining the location where seepage is entering the abutment area.

COPY

-2-

Based upon the opinion of the County Hydraulic Engineer, conditions at the dam are not dangerous, but you are advised to observe the area frequently and report any change, particularly if an increase in the wet condition is noted.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDRE-A

23 May 1969

William J. Foley, Esq.
Counsel
Hampden County Commissioners
52 State Street
Springfield, Massachusetts 01103

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-64-204

Dear Mr. Foley:

Under terms of the proposed Relocation Agreement, the Town of Monson and the County were to abandon certain public roads in the project area. The County roads which were to be abandoned are approximately 2,700 feet of new Wales Road and approximately 825 feet of Pond Road. A section of Wales Road owned in fee by the County and designated as Tract 216 was to be conveyed to the United States by a Quitclaim Deed.

It is my understanding that the above matters have been completed but we do not have the necessary copies of the abandonment proceedings or the deed of Tract 216 for our files.

I would appreciate it if you could supply this office with the above.

Thank you for your understanding and cooperation.

Sincerely yours,

M. S. Phillips

M. S. PHILLIPS
Chief, Real Estate Division

NEDRE-A

23 May 1969

William J. Foley, Esq.
Counsel
Hampden County Commissioners
52 State Street
Springfield, Massachusetts 01103

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-64-204

Dear Mr. Foley:

Under terms of the proposed Relocation Agreement, the Town of Monson and the County were to abandon certain public roads in the project area. The County roads which were to be abandoned are approximately 2,700 feet of new Wales Road and approximately 825 feet of Pond Road. A section of Wales Road owned in fee by the County and designated as Tract 216 was to be conveyed to the United States by a Quitclaim Deed.

It is my understanding that the above matters have been completed but we do not have the necessary copies of the abandonment proceedings or the deed of Tract 216 for our files.

I would appreciate it if you could supply this office with the above.

Thank you for your understanding and cooperation.

Sincerely yours,

M. S. PHILLIPS
Chief, Real Estate Division

County of Hampden

NEDRE-C

23 November 1970

Board of Selectmen
Town Hall
Monson, Massachusetts 01057

Gentlemen:

Re: Conant Brook Dam and Reservoir, Contract No.
DA-19-016-CIVENG-64-204

Reference is made to Article 1 d. of the inclosed copy of the above-referenced contract and to the Annual Town Meeting held 22 March 1967 relative thereto. Under Article 60, the Town voted to abandon certain roads as described within the minutes of the meeting. These roads are outlined in red on our Segment "3", Real Estate, Conant Brook Dam and Reservoir Map, a copy of which is inclosed for your information and file.

It is necessary that this office be furnished with a certified copy of the abandonment proceedings. Receipt of such certification will enable this office to institute final payment in accordance with Article 2 c. for work performed under Article 1.

Sincerely yours,

2 Incl
As stated

M. S. PHILLIPS
Chief, Real Estate Division

INCL. 5

NEDRE-C

William J. Foley, Esq.

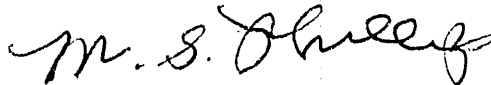
25 November 1970

The original and two copies of the Quitclaim Deed are inclosed for your approval and execution. Please return two executed copies of the deed for our files, together with a certificate of the abandonment proceedings for the 825-foot section of Pond Road.

When the Town of Monson and County of Hampden have fulfilled respective obligations in accordance with Article 1 d, it will enable this office to institute completion of the Government's obligation in accordance with Article 2 e as provided in Article 1 f. The Town of Monson has been notified of its existing obligation as stated in our letter of 23 November 1970. A copy of this letter is inclosed for your information.

Your cooperation in returning the abandonment certificate for the County portion of Pond Road and the executed quitclaim deed for New Wales Road, Tract 216, at an early date will be appreciated.

Sincerely yours,



M. S. PHILLIPS

Chief, Real Estate Division

5 Incl

1. Contract
2. Dwg, Segmt 2
3. Dwg, Segmt 3
4. Quitclaim Deed (trip)
5. Ltr, 23 Nov 70

CF: Board of Selectmen
Town Hall
Monson, Massachusetts 01057



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDRE-C

25 November 1970

William J. Foley, Esq.
Counsel
Hampden County
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Foley:

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-64-204

Reference is made to Article 1 d of the referenced Relocation Agreement, a copy of which is inclosed for your files. In accordance therewith, the Town of Monson and the County of Hampden are required to abandon certain public roads within the project area. The County roads involved are approximately 825 feet of Pond Road and also approximately 2700 feet of New Wales Road.

The description for the 825-foot portion of Pond Road to be abandoned by the County is as follows:

Pond Road--Beginning at the easterly side of East Hill Road and running easterly a distance of about 825 feet to the point of ending. Being that portion of Pond Road laid out by the County Commissioners of Hampden County.

The 2700-foot section of New Wales Road is owned in fee by the County and must be conveyed to the United States by Quitclaim Deed. The pertinent County portions of Pond Road and New Wales Road are outlined in green on the following Real Estate Drawings, one copy of each, which are inclosed for information and file:

Segment "2", Conant Brook Dam and Reservoir

Segment "3", Conant Brook Dam and Reservoir

NEDRE-C

25 November 1970

William J. Foley, Esq.
Counsel
Hampden County
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Foley:

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-64-204

Reference is made to Article 1 d of the referenced Relocation Agreement, a copy of which is inclosed for your files. In accordance therewith, the Town of Monson and the County of Hampden are required to abandon certain public roads within the project area. The County roads involved are approximately 825 feet of Pond Road and also approximately 2700 feet of New Wales Road.

The description for the 825-foot portion of Pond Road to be abandoned by the County is as follows:

Pond Road--Beginning at the easterly side of East Hill Road and running easterly a distance of about 825 feet to the point of ending. Being that portion of Pond Road laid out by the County Commissioners of Hampden County.

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Segment "2", Conant Brook Dam and Reservoir

Segment "3", Conant Brook Dam and Reservoir

NEDAE-C

25 November 1970

William J. Foley, Esq.

The original and two copies of the Quitclaim Deed are inclosed for your approval and execution. Please return two executed copies of the deed for our files, together with a certificate of the abandonment proceedings for the 825-foot section of Pond Road.

When the Town of Monson and County of Hampden have fulfilled respective obligations in accordance with Article 1 d, it will enable this office to institute completion of the Government's obligation in accordance with Article 2 c as provided in Article 1 f. The Town of Monson has been notified of its existing obligation as stated in our letter of 23 November 1970. A copy of this letter is inclosed for your information.

Your cooperation in returning the abandonment certificate for the County portion of Pond Road and the executed quitclaim deed for New Wales Road, Tract 216, at an early date will be appreciated.

Sincerely yours,

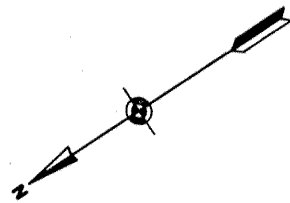
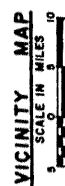
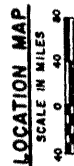
5 Incl

1. Contract
2. Dwg, Segmt 2
3. Dwg, Segmt 3
4. Quitclaim Deed (trip)
5. Ltr, 23 Nov 70

H. S. PHILLIPS

Chief, Real Estate Division

CF: Board of Selectmen
Town Hall
Monson, Massachusetts 01057



RESERVOIR PLAN

SCALE IN FEET

500' 0 500' 1000'

ROAD TO BE ABANDONED

ROAD RELOCATION

FLOWAGE EASEMENT

ROAD TO BE RAISED

ROAD TO BE IMPROVED

ROAD TO BE IMPROVED

ACCESS ROAD

TURNAROUND

TURNAROUND

[illegible]

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

CONNECTICUT RIVER FLOOD CONTROL
CHICOPEE RIVER BASIN

ONANT BROOK DAM HIGHWAY RELOCATIONS

HICOPEE RIVER, MASSACHUSETTS

DATE MARCH 1963

SCALE AS SHOWN SPEC. NO. CIV. ENG. - 19-016 -

11211

19

PLATE NO. 5-12

*Orig. & copies
County of Hampden*

KNOW ALL MEN BY THESE PRESENTS

That the COUNTY OF HAMPDEN, legally organized and existing under the laws of the Commonwealth of Massachusetts acting by and through its Commissioners, hereunto duly authorized in consideration of ONE DOLLAR (\$1.00) paid by the United States of America, grants to the UNITED STATES OF AMERICA and its assigns with QUITCLAIM COVENANTS, a certain parcel of land in the Town of Monson, County of Hampden, Commonwealth of Massachusetts, bounded and described as follows:

A certain tract of land sixty and no hundredths (60.00) feet wide constituting part of Wales Road, so-called, in the southerly part of the Town of Monson, County of Hampden, in the Commonwealth of Massachusetts, and more particularly bounded and described as follows:

Beginning at a concrete bound marked "H-C-H" in the southerly sideline of said Wales Road opposite Station 79/06.14 on the centerline of the 1936 County Commissioners layout; said beginning point having coordinates in the Massachusetts Plane Coordinate System, Mainland Zone of E 384,452.88, N 391,963.42 and being southeasterly a distance of about two hundred and twenty and no hundredths (220.00) feet from the center of the Town Water Department dam on Conant Brook, so-called;

thence N 18°27'25" W a distance of sixty and no hundredths (60.00) feet across the said Wales Road to an iron pipe;

thence easterly and southeasterly a distance of about thirty-two hundred thirty-four and no hundredths (3234.00) feet along the northerly and northeasterly sideline of said Wales Road along land of the Town of Monson, land of Evelyn S. Shaw, other land of the Town of Monson, and land of Richard S. Sutcliffe to an iron pipe;

thence S 57°57'08" E a distance of one hundred eighty-six and twenty-seven hundredths (186.27) feet along the said northeasterly sideline of Wales Road along said land of Richard S. Sutcliffe to an iron pipe;

thence S 32°02'52" W a distance of sixty and no hundredths (60.00) feet across said Wales Road to an iron pipe;

thence northwesterly and westerly a distance of about three thousand three hundred sixty-eight and no hundredths (3368.00) feet along the southwesterly and southerly sideline of said Wales Road along land of Richard S. Sutcliffe, land of Wilford F. Plumley and land of Arthur C. North to the point of beginning;

containing 4.67 acres more or less;

being part of the road acquired and laid out by the Commissioners of Hampden County on October 24, 1934 and November 18, 1936, and all of the road acquired and laid out by the Commissioners of Hampden County on October 9, 1935, and recorded in Hampden County Registry of Deeds in Book 1581 Page 466, Book 1610 Page 362, and Book 1628 Page 456.

The above estate is subject to existing easements for public utilities, for railroads and pipelines.

This conveyance is made pursuant to the terms and conditions of Contract No. DA-19-016-64-204 dated 5 February 1964 between the parties hereto.

INCL: 4

IN WITNESS WHEREOF, the said County of Hampden has caused these presents to be signed and its corporate seal hereunto affixed by _____, and _____ its Commissioners thereunto duly authorized this 2nd. day of December 1970.

Signed, Sealed and Delivered in the presence of:

COUNTY OF HAMPDEN
BY Stephen A. Moynahan (SEAL)
William F. Stapleton (SEAL)
Lloyd W. Fradet (SEAL)
Its COUNTY COMMISSIONERS

COMMONWEALTH OF MASSACHUSETTS

Hampden, ss.

Then personally appeared the above named Stephen A. Moynahan, William F. Stapleton and Lloyd W. Fradet, Commissioners of Hampden County of the County of Hampden, Massachusetts and acknowledged the foregoing instrument to be their free act and deed and the free act and deed of the County of Hampden, before me,

William C. Flanagan
Notary Public

My commission expires June 21, 1974 (NOTARIAL SEAL)

December 10, 1970

M.S. Phillips
Chief, Real Estate Division
Department of the Army
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Mr. Phillips:

Re: Conant Brook Dam and Reservoir Project
Contract No. DA-19-016-CIVENG-64-204

Enclosed please find deeds, as requested in your
letter of 25 November 1970.

The commissioners have instructed me to prepare
the certificate of abandonment of the 825-foot portion
of Pond Road, and I shall forward that to you shortly.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____
County Counsel.

WCF:F

Enclosures

*Daily
Check*

Back to 1961

*Town Acct
no recollection of
any expenditure
made*

Contract not to

January 8, 1971

expend going on

nowhere

*Town Acct going over
it - Friday AM*

Department of the Army
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Gentlemen:

Re: Conant Brook Dam and Reservoir, Contract No.
DA-19-016-CIVENG-64-204

In accordance with your request, we are furnishing herewith a
certified copy of the abandonment proceedings.

This abandonment was voted at the Annual Town Meeting held
March 22, 1967.

Sincerely,

Amos P. Bradley
Albert B. Carls
Raymond

Board of Selectmen

OEB/da



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDRE-C

8 February 1971

Board of Selectmen
Town Hall
Monson, Massachusetts 01057

Gentlemen:

Re: Conant Brook Dam and Reservoir
Contract No. DA-19-016-CIVENG-64-204

Reference is made to your letter of 8 January 1971. We wish to acknowledge receipt of certification of the abandonment proceedings under your Article 60, for East Hill Road, Water Works Road and Pond Road.

Your attention is called to Article 2 c. Our contract file does not disclose that an invoice has been received from the Town as described in lines 20 through 22. Please furnish this office with a properly certified invoice, in quadruplicate, stating the costs expended in connection with the discontinuance, abandonment and vacation of the above-referenced highway facilities. When this invoice is received, our Finance and Accounting Office will proceed to pay the Town in accordance with Article 1 g for the work described herein and performed under Article 1 d.

The Government will subsequently fulfill its obligation to the Town and County in accordance with Article 2 e.

Thank you for your cooperation.

Sincerely yours,

M. S. PHILLIPS
Chief, Real Estate Division

CF:
William J. Foley, Esq.
Counsel
Hampden County
52 State Street
Springfield, Mass. 01103

MEMRE-C

22 June 1972

William J. Foley, Esq.
County Counsel
Hamden County
52 State Street
Springfield, Mass. 01103

Dear Mr. Foley:

Re: Conant Brook Dam Project
Contract No. DA-19-016-CIVENG-64-204

Reference is made to your letter of December 10, 1970, relative to our letter of 25 November 1970. In your letter, you stated that the commissioners had authorized you to prepare a certificate of abandonment for the 825-foot portion of Pond Road as outlined in green on the inclosed copy of Seg "3" Real Estate, Conant Brook Dam drawing. A copy of this outlined drawing was also an inclosure to our referenced letter.

Due to the fact that it has been quite some time since your previous letter with which you inclosed the Deed conveying 2700 feet of New Wales Road to the Government in fee, it may be that the matter of certificate of abandonment for said portion of Pond Road is being held in abeyance because of the need for description thereof. We are also including a duplicate description of that section of Pond Road involved as follows:

Pond Road-- Beginning at the easterly side of East Hill Road and running easterly a distance of about 825 feet to the point of ending. Being that portion of Pond Road laid out by the County Commissioners, Hamden County.

May we hear from you at an early date regarding the Certificate of Abandonment for that portion of Pond Road specified herein?

Sincerely yours,

1 Incl
As stated

H. S. PHILLIPS
Chief, Real Estate Division



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

23 June 1972

IN REPLY REFER TO:
NEDRE-C

Board of Selectmen
Town of Monson
Memorial Town Hall
Monson, Massachusetts 01057

Gentlemen:

Re: Conant Brook Dam - Contract No. DA-19-016-CIVENG-64-201

Reference is made to our letter of 8 February 1971 regarding work which the Town is obligated to complete in accordance with ARTICLE 1.

The Town has to date fulfilled all obligations with the exception of providing this office with a certified invoice, in quadruplicate, for work performed under ARTICLE 1, further described under ARTICLE 2 (c), lines one through five, and lines seventeen and eighteen. The Government can reimburse the Town for the cost of legal work pertaining to abandonment of real estate interests described under ARTICLE 1, upon receipt of a properly certified invoice, in quadruplicate, as requested herein.

May we expect to hear from you at an early date regarding this matter? If there is no reply to this letter within the three-week period following, this office will assume that you do not wish to furnish the necessary invoice and will consider the matter closed.

The obligation of the Government under ARTICLE 2 (c), however, will be fulfilled. The outgrants to the Town and/or County will be submitted for review and approval prior to being submitted to the Office of the Chief of Engineers, Washington, D. C., for final approval and execution in the Office of the Secretary of the Army.

Sincerely yours,

CF: William J. Foley, Esq.

County Counsel, Hampden

County, 52 State St., Springfield, MA 01103

Miss Lois J. Tirrell, Town Clerk, Memorial Town Hall,
Town of Monson, MA 01057

M. S. PHILLIPS

Chief, Real Estate Division



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDRE-C

20 July 1972

Board of Selectmen
Town of Monson
Memorial Town Hall
Monson, Massachusetts 01057

Gentlemen:

Re: Conant Brook Dam - Relocation
Contract DA-19-016-CIVENG-64-204

Please refer to the inclosed copy of our letter of 23 June 1972 in which we reminded you that in accordance with Article 2(c) we required a certified invoice, in quadruplicate, for the total cost of the legal work involved for the cost of abandonment of real estate interests accomplished by the Town and/or County under Article 1. If either the Town or County will refer to Article 1(c), line eighteen, it will be quickly noted that the sum of money involved and listed as an unliquidated obligation, on the part of the Government, is not small. Since the latter is true, this office cannot understand why the invoice has not been sent.

We have hesitated to have the amount classed as an unused item and the obligation removed from Accounting Records. However, since you have not answered our letter of 23 June 1972, we have no further recourse but to assume that the Town or County does not find it necessary to furnish the required invoice. Therefore, the matter is considered a closed issue and the obligation removed from Accounting Records.

Sincerely yours,

1 Incl
Letter, 23 June 72

M. S. PHILLIPS
Chief, Real Estate Division

CF: William J. Foley, Esq.
Hampden County Counsel
52 State Street
Springfield, Mass. 01103

July 21, 1972

Mr. M. S. Phillips
Chief, Real Estate Division
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

Re: Conant Brook Dam - Relocation
Contract DA-19-016-CIVENG-62-204

This refers to your letter of July 20, 1972 to the
Board of Selectmen, Town of Monson, with copy to William
J. Foley, Esq., Hampden County Counsel.

Mr. Foley is no longer the County Counsel and our present
Counsel, William C. Flanagan, is on vacation and is not expected
back until Wednesday, July 26, 1972; at which time this matter
will be brought to his attention.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By (Mr.) Kenneth M. Lynch

cc: Board of Selectmen
Monson, Mass.



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDRE-C

22 June 1972

William J. Foley, Esq.
County Counsel
Hampden County
52 State Street
Springfield, Mass. 01103

REC'D COUNTY COMMS.
JUN 26 8 54 AM '72
COUNTY
OF
HAMPDEN

Dear Mr. Foley:

Re: Conant Brook Dam Project
Contract No. DA-19-016-CIVENG-64-204

Reference is made to your letter of December 10, 1970, relative to our letter of 25 November 1970. In your letter, you stated that the commissioners had authorized you to prepare a certificate of abandonment for the 825-foot portion of Pond Road as outlined in green on the inclosed copy of Seg "3" Real Estate, Conant Brook Dam drawing. A copy of this outlined drawing was also an inclosure to our referenced letter,

Due to the fact that it has been quite some time since your previous letter with which you inclosed the Deed conveying 2700 feet of New Wales Road to the Government in fee, it may be that the matter of certificate of abandonment for said portion of Pond Road is being held in abeyance because of the need for description thereof. We are also including a duplicate discription of that section of Pond Road involved as follows:

Pond Road-- Beginning at the easterly side of East Hill Road and running easterly a distance of about 825 feet to the point of ending. Being that portion of Pond Road laid out by the County Commissioners, Hampden County.

May we hear from you at an early date regarding the Certificate of Abandonment for that portion of Pond Road specified herein?

Sincerely yours,

M. S. Phillips

M. S. PHILLIPS
Chief, Real Estate Division

1 Incl
As stated

County of Hampden

CONTRACT NO. DA-19-016-CIVENG-64-204

DATE 5 February 1964

CONTRACT FOR RELOCATION, REARRANGEMENT AND/OR ALTERATION
OF FACILITIES
(COST REIMBURSABLE)

| | |
|---------------|--|
| Contractor: | Town of Monson and County of Hampden, Massachusetts |
| Contract For: | Relocation, Rearrangement and/or Alteration of Highway Facilities |
| Location: | Conant Brook Dam and Reservoir Project, Massachusetts |

This contract is authorized by the following law:

Act of Congress Approved 14 July 1960
(Public Law 86-645, 86th Congress, 74 Stat 480)

Appropriation: 96X3122 Construction General
Corps of Engineers, Civil

INCL. 1

DESCRIPTION

Pond Road - Beginning at the easterly side of East Hill
Road and running easterly a distance of about 825 feet to the point
of ending. Being that portion of Pond Road laid out by the County
Commissioners, Hampden County.

Inf.

*William J. Foley, Esq.
Hampden Co. Counsel*

RECEIVED

23 June 1972

Board of Selectmen
Town of Monson
Memorial Town Hall
Monson, Massachusetts 01057

Gentlemen:

Re: Conant Brook Dam - Contract No. DA-19-016-CIVENG-64-30

Reference is made to our letter of 8 February 1971 regarding work which the Town is obligated to complete in accordance with ARTICLE 1.

The Town has to date fulfilled all obligations with the exception of providing this office with a certified invoice, in quadruplicate, for work performed under ARTICLE 1, further described under ARTICLE 2 (c), lines one through five, and lines seventeen and eighteen. The Government can reimburse the Town for the cost of legal work pertaining to abandonment of real estate interests described under ARTICLE 1, upon receipt of a properly certified invoice, in quadruplicate, as requested herein.

May we expect to hear from you at an early date regarding this matter? If there is no reply to this letter within the three-week period following, this office will assume that you do not wish to furnish the necessary invoice and will consider the matter closed.

The obligation of the Government under ARTICLE 2 (c), however, will be fulfilled. The outgrants to the Town and/or County will be submitted for review and approval prior to being submitted to the Office of the Chief of Engineers, Washington, D. C., for final approval and execution in the Office of the Secretary of the Army.

Sincerely yours,

WJ: William J. Foley, Esq.

M. S. PHILLIPS

County Counsel, Hampden

Chief, Real Estate Division

County, 22 State St., Springfield, MA 01103

Miss Lois J. Tirrell, Town Clerk, Memorial Town Hall,

Town of Monson, MA 01057

Incl. 1

August 2, 1972

Mr. M. S. Phillips
Chief, Real Estate Division
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

Re: Conant Brook Dam - Relocation
Contract DA-19-016-CIVENG-62-204

I have reviewed this matter and since everything up to date was handled by Attorney William J. Foley, I would like to discuss it with him.

I called his office upon my return to discuss this matter with him but he is on vacation and not expected back until August 22nd; at which time I will talk to him.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____
County Counsel

WCFA:L

cc: Board of Selectmen
Monson, Mass.

NEDRE-C

9 August 1972

William C. Flannagan, Esquire
County Counsel
Hampden County, County Commissioners
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Flannagan:

Re: Conant Brook Dam
Contract No. DA-19-016-CIVENG-64-204

Please refer to your letter of 2 August 1972. No further action will be taken in this matter until you have had an opportunity for discussion with Attorney William J. Foley, previous County Counsel.

It would also be appreciated if you would discuss our letter of 22 June 1972. Paragraphs two and three request the attention of your office to abandoning approximately 825 feet of Pond Road. Attorney Foley's letter of 10 December 1970, to this office stated that the County Commissioners had authorized him to furnish evidence of abandonment of the 825 foot portion of said road. Completion of the referenced actions would fulfill the obligation of the County under said contract.

Thank you for your prompt reply.

Sincerely yours,

M. S. PHILLIPS
Chief, Real Estate Division



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:

NEDRE-C

9 August 1972

William C. Flannagan, Esquire
County Counsel
Hampden County, County Commissioners
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Flannagan:

Re: Conant Brook Dam
Contract No. DA-19-016-CIVENG-64-204

Please refer to your letter of 2 August 1972. No further action will be taken in this matter until you have had an opportunity for discussion with Attorney William J. Foley, previous County Counsel.

It would also be appreciated if you would discuss our letter of 22 June 1972. Paragraphs two and three request the attention of your office to abandoning approximately 825 feet of Pond Road. Attorney Foley's letter of 10 December 1970, to this office stated that the County Commissioners had authorized him to furnish evidence of abandonment of the 825 foot portion of said road. Completion of the referenced actions would fulfill the obligation of the County under said contract.

Thank you for your prompt reply.

Sincerely yours,

M. S. PHILLIPS
Chief, Real Estate Division

REC'D COUNTY COMS
AUG 11 9 53 AM '72
COUNTY
OF
HAMPDEN



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:
NEDRE-C

28 August 1972

William C. Flannagan, Esq.
County Counsel
Hampden County, County Commissioners
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Flannagan:

Re: Conant Brook Dam - Relocation Contract
No. DA-19-016-CIVENG-64-204

Your attention is called to your letter of 2 August 1972 relative to a certified invoice (in quadruplicate) for the cost of legal work applicable to abandonment of real estate interests. Said interests are fully explained under ARTICLE 1 of the referenced contract.

There is also the matter of County abandonment of approximately an 825 section of Pond Road, together with a certified copy of the notice of abandonment to be furnished to this office.

When your discussion with Attorney William J. Foley has been concluded, may we hear from you at an early date?

Sincerely yours,

CF: Board of Selectmen
Town Hall, Monson, Mass. 01057

M. S. PHILLIPS
Chief, Real Estate Division



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO:
NEDRE-C

28 August 1972

REC'D COUNTY COMMS.

AUG 29 9 23 AM '72

COUNTY
OF
HAMPDEN

William C. Flannagan, Esq.
County Counsel
Hampden County, County Commissioners
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Flannagan:

Re: Conant Brook Dam - Relocation Contract
No. DA-19-016-CIVENG-64-204

Your attention is called to your letter of 2 August 1972 relative to a certified invoice (in quadruplicate) for the cost of legal work applicable to abandonment of real estate interests. Said interests are fully explained under ARTICLE 1 of the referenced contract.

There is also the matter of County abandonment of approximately an 825 section of Pond Road, together with a certified copy of the notice of abandonment to be furnished to this office.

When your discussion with Attorney William J. Foley has been concluded, may we hear from you at an early date?

Sincerely yours,

CF: Board of Selectmen
Town Hall, Monson, Mass. 01057
M. S. PHILLIPS
Chief, Real Estate Division

COMMONWEALTH OF MASSACHUSETTS

Hampden, ss: County Commissioners' Meeting January 3, 1973

KNOW ALL MEN BY THESE PRESENTS

That the County of Hampden, hereby orders and
decrees the abandonment of

POND ROAD, Town of Monson--Beginning at the easterly
side of East Hill Road and running easterly a distance of
about 325 feet to the point of ending. Being that portion
of Pond Road laid out by the County Commissioners, Hampden
County, in accordance with Contract No. DA-19-016-CIVENG-
64-204, dated February 5, 1964, between the UNITED STATES
OF AMERICA and the COUNTY OF HAMPDEN.

STEPHEN A. MOYNAHAN

ARMANDO G. DIMAURO

HAMPDEN COUNTY COMMISSIONERS

A true copy,

Attest _____ Clerk

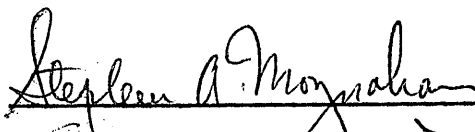
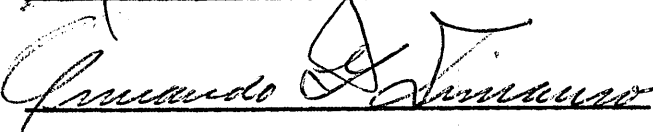
COMMONWEALTH OF MASSACHUSETTS

Hampden, ss: County Commissioners' Meeting January 3, 1973

KNOW ALL MEN BY THESE PRESENTS

That the County of Hampden, hereby orders and decrees the abandonment of

POND ROAD, Town of Monson--Beginning at the easterly side of East Hill Road and running easterly a distance of about 825 feet to the point of ending. Being that portion of Pond Road laid out by the County Commissioners, Hampden County, in accordance with Contract No. DA-19-016-CIVENG-64-204, dated February 5, 1964, between the UNITED STATES OF AMERICA and the COUNTY OF HAMPDEN.

HAMPDEN COUNTY COMMISSIONERS

XXXXXXXXXXXXX
XXXXXXXXXXXXX
 , Ch.
Stephen A. Moynahan
Richard S. Thomas

Re: Canant Brook Dam - Relocation Contract
-CIVENG-64-204

There is enclosed herewith an attested copy of the abandonment of approximately an 825 section of Pond Road in the Town of Monson, Massachusetts.

HAMPDEN COUNTY COMMISSIONERS

Enclosure

February 12, 1973

xxxxx
xxxxxxxxxxxxxx, Ch.

Richard S. Thomas

Board of Selectmen
Town of Monson
Monson, Massachusetts

Gentlemen:

Enclosed please find an attested copy
of a decree of abandonment of POND ROAD in the Town
of Monson--beginning at the easterly side of East
Hill Road and running easterly a distance of about
825 feet to the point of ending. Being that portion
of Pond Road laid out by the County Commissioners,
Hampden County, in accordance with Contract No.
DA-19-016-CIVENG-64-204, dated February 5, 1964
between the United States of America and the County
of Hampden.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____

County Counsel

WCF:C

Enc.



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDRE-C

27 March 1974
REC'D COUNTY COMMS.

MAR 29 12 08 PM '74

COUNTY
OF
HAMPDEN

William C. Flannagan, Esq.
County Counsel
Hampden County Commissioners
52 State Street
Springfield, Massachusetts 01103

Dear Mr. Flannagan:

Re: Conant Brook Dam, Mass.
Contract No. DA-19-016-CIVENG-64-204
(Road Relocations)

Reference is made to the above-named contract and to previous correspondence from this office requesting the County to abandon approximately 825 feet of Pond Road.

You indicated some time ago that after conferring with your predecessor, a certificate of abandonment would be forwarded to this office. It is requested that the aforementioned item be forwarded to this office at the earliest possible date. A copy of the road description is inclosed for your convenience.

The assistance of your office in bringing this long-standing obligation to a conclusion would be appreciated.

Sincerely yours,

M. S. PHILLIPS
Chief, Real Estate Division

1 Incl
As stated

April 4, 1974

M.S. Phillips,
Chief, Real Estate Division
Department of the Army
424 Trapelo Road
Waltham, Massachusetts

Re: Conant Brook Dam, Mass.
Contract No. DA-19-016-CIVENG-64-204
(Road Relocations)

Dear Mr. Phillips:

This is to acknowledge receipt of your letter dated March 27, 1974, addressed to William C. Flanagan, Esq.

The information (certificate of abandonment) requested by you, was forwarded to you under date of February 9, 1973, by Mr. Flanagan.

A copy of this decree and Mr. Flanagan's letter to you are herewith enclosed.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

By _____
County Counsel

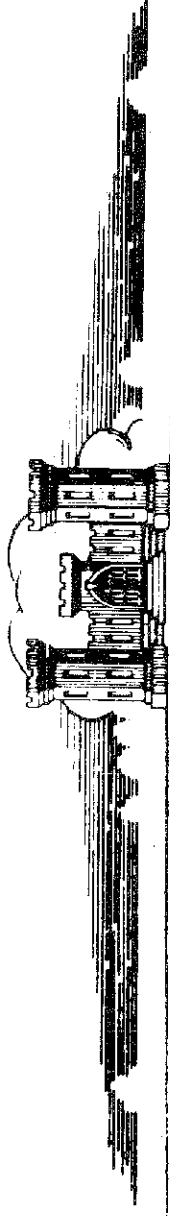
SJB:C

Enc.

CONNECTICUT RIVER FLOOD CONTROL PROJECT
CONANT BROOK DAM
CHICOPEE RIVER, MASSACHUSETTS

PLANS FOR THE
CONSTRUCTION OF DAM
AND
APPURTENANT STRUCTURES

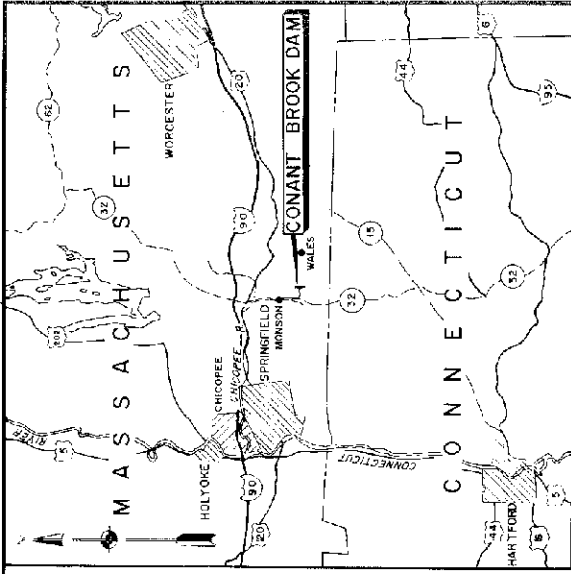
VOLUME I



U.S. Army Engineer Division, New England
Corps of Engineers Waltham, Mass.

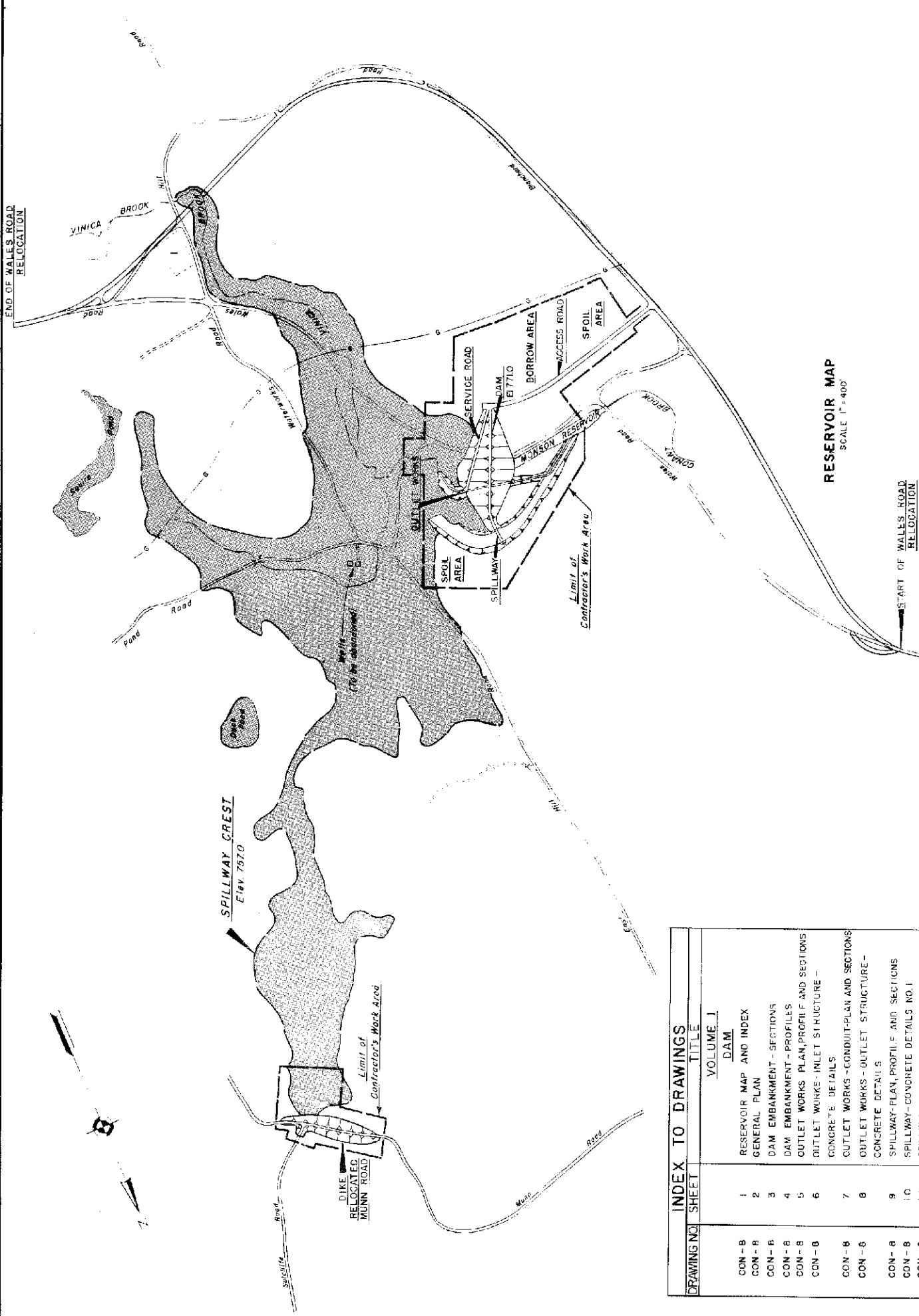
APRIL 1964

All drawings in this folio
have been reduced to one
half the original scale.



LOCATION MAP

SCALE: 1" = 8 MI.



RESERVOIR MAP

SCALE: 1" = 400'

NOTE
For General Notes, see Sheet 2
For Legend, see Sheet 2
For details of walls, to be abandoned, see specifications.

| DRAWING NO. | SHEET | TITLE |
|-------------|--------|--|
| CON - 8 | 1 | RESERVOIR MAP AND INDEX |
| CON - 8 | 2 | GENERAL PLAN |
| CON - 8 | 3 | DAM EMBANKMENT - SECTIONS |
| CON - 8 | 4 | DAM EMBANKMENT - PROFILES |
| CON - 8 | 5 | OUTLET WORKS - PLAN, PROFILE AND SECTIONS |
| CON - 8 | 6 | OUTLET WORKS - INLET STRUCTURE - CONCRETE DETAILS |
| CON - 8 | 7 | OUTLET WORKS - CONDUIT-PLAN AND SECTIONS |
| CON - 8 | 8 | OUTLET WORKS - OUTLET STRUCTURE - CONCRETE DETAILS |
| CON - 8 | 9 | SPILLWAY-PLAN, PROFILE AND SECTIONS |
| CON - 8 | 10 | SPILLWAY-CONCRETE DETAILS NO. 1 |
| CON - 8 | 11 | SPILLWAY-CONCRETE DETAILS NO. 2 |
| CON - 8 | 12 | DIKE-PLAN, PROFILES AND SECTIONS |
| CON - 8 | 13 | LOG BOOM, STIFF GAGES AND PARKING AREA |
| CON - 8 | 14 | BUBBLE GAGE SHELTER - DETAILS |
| CON - 8 | 15 | BUBBLE GAGE SHELTER-STEEL REINFORCEMENT |
| CON - 8 | 16 | FLAQUE-SECTIONS AND DETAILS |
| CON - 8 | 17 | PLAN OF FOUNDATION EXPLORATIONS |
| CON - 8 | 18 | GEOLOGIC - LOG SECTIONS - DAM |
| CON - 8 | 19 | GEOLOGIC - LOG SECTIONS - SPILLWAY |
| CON - 8 | 20 | GEOLOGIC - LOG SECTIONS - CONDUIT |
| CON - 8 | 21 | RECORD OF FOUNDATION EXPLORATIONS NO. 1 |
| CON - 8 | 22 | RECORD OF FOUNDATION EXPLORATIONS NO. 2 |
| CON - 8 | 23 | RECORD OF FOUNDATION EXPLORATIONS NO. 3 |
| CON - 8 | 24 | RECORD OF FOUNDATION EXPLORATIONS NO. 4 |
| CON - 8 | 25 | PLAN OF BORROW EXPLORATIONS |
| CON - 8 | 26 | RECORD OF BORROW EXPLORATIONS |
| CON - 8 | 27 | HYDROGRAPHS |
| CON - 8 | 27A | CONSTRUCTION SIGN |
| 40-05-06 | 1 OF 1 | SAFETY SIGN |
| 40-16-08 | — | SAFETY FENCE - 4' FABRIC |
| STD - 8 | — | STRUCTURAL JOINT DETAILS |

| DRAWING NO. | SHEET | TITLE |
|-------------|-------|--|
| SK 106 | — | STORAGE BUILDING |
| — | — | JUTE MATTING - INSTALLATION DETAILS |
| CON - 9 | — | VOLUME II HIGHWAY RELOCATION AND ACCESS ROAD GENERAL - PLAN AND INDEX |

| DRAWING NO. | SHEET | TITLE |
|-------------|-------|--|
| CON - 9 | — | VOLUME II HIGHWAY RELOCATION AND ACCESS ROAD GENERAL - PLAN AND INDEX |

GRAPHIC SCALES



CONNECTICUT RIVER FLOOD CONTROL

CONANT BROOK DAM

RESERVOIR MAP AND INDEX

CHICOPEE RIVER, MASSACHUSETTS

DATE: APRIL 1964

SCALE: AS SHOWN

DRAWING NUMBER: CON-8

SHEET 1

LEGEND

- Contour (orig ground surf.)
- Rock or ledge outcrop (plan)
- Earth cut and rock cut
- Earth cut with rock slope protection
- Earth fill
- Earth fill with rock slope protection
- Earth surface (section)
- Assumed bedrock surface or rock cut (section)
- Staff gage
- Tennessee Gas Line

GENERAL NOTES

- Elevations refer to Mean Sea Level Datum.
- Plane coordinates refer to Massachusetts Lambert Grid System.
- Figures in hexagon indicate item numbers under which payment will be made.
- All topsoil, 6" in thickness, unless otherwise noted.
- For limits of Contractor's Work Area, see Sheet 1.
- For fence and gate details, see specific details.
- Strip to suitable material.

NOTES

- For Dam Embankment, Profile, Sections and Details, see Sheet 3 and 4.
- For Outlet Works, Plan, Profile, Sections and Details, see Sheets 5 thru 8.
- For Spillway Plan, Profile and Sections, see Sheet 9 thru 11.
- For Bubble Gage, Shutter Details, see Sheet 14 & 15.
- For Log Boom, Staff Gages & Parking Area details, see Sheet 15.
- For excavating and refilling of the excavation for the removal of the C.T. water main, see Sheet 5.

GRAPHIC SCALE
1" = 40'
0 40 80

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
BOSTON, MASS.

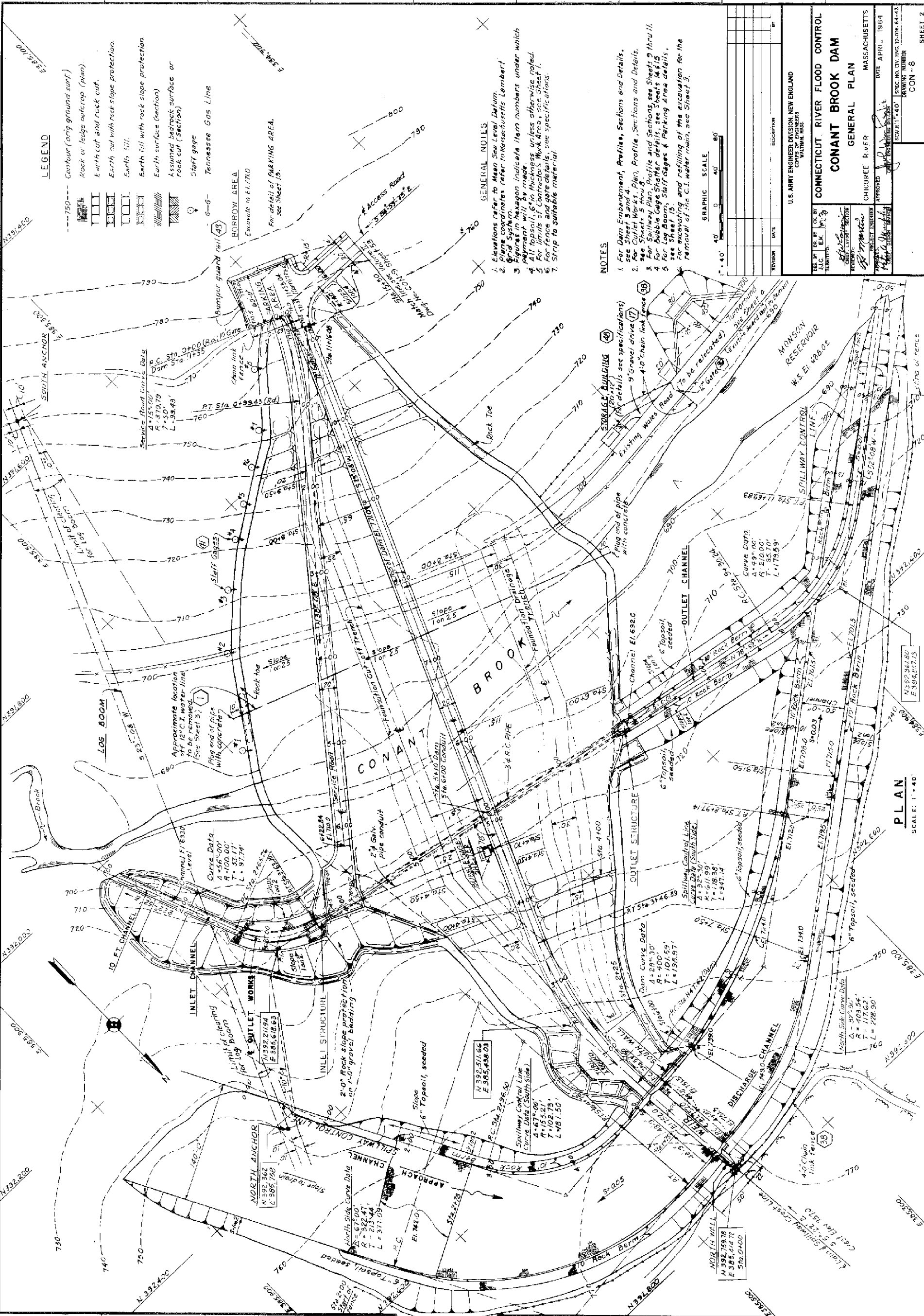
CONNECTICUT RIVER FLOOD CONTROL
CONANT BROOK DAM
GENERAL PLAN

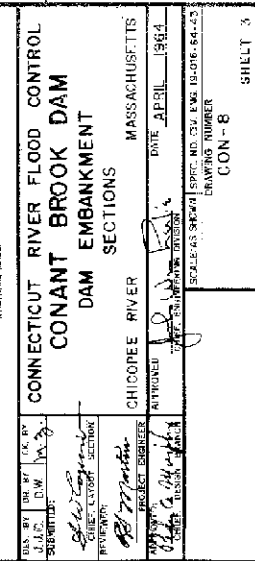
CHICOREE RIVER
MASSACHUSETTS
DATE: APRIL 1964
APPROVED: [Signature]
DESIGNED: [Signature]

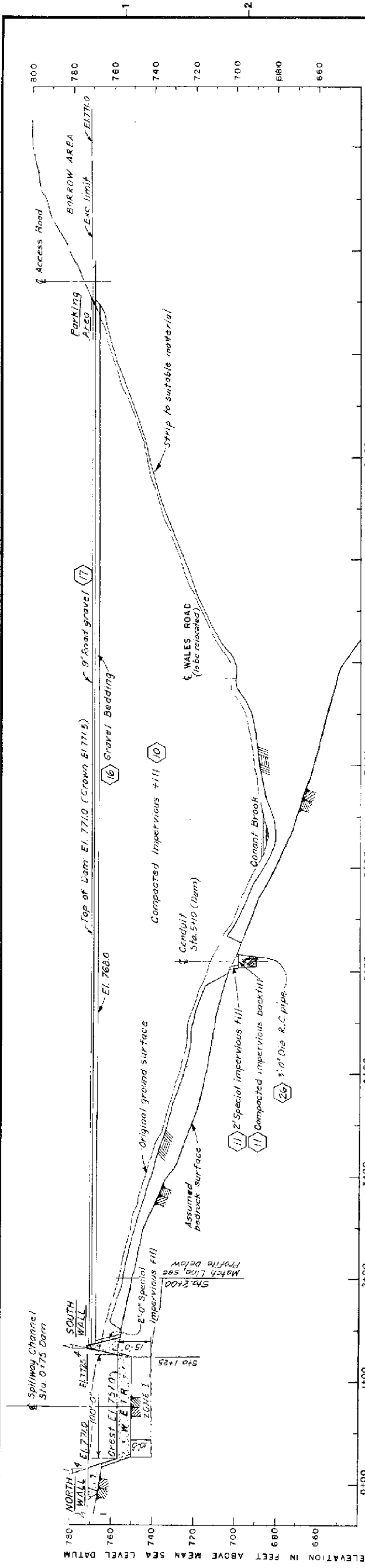
SCALE: 1" = 40'
DRAWING NUMBER: CON-8
SHEET 2

PLAN

SCALE: 1" = 40'

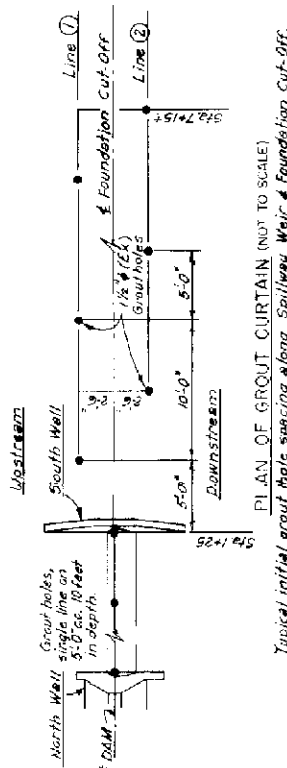




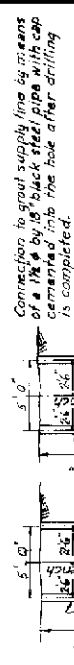


PROFILE ALONG C OF DAM

SCALE: HOR. 1"=40'
VERT. 1"=20'



PLAN OF GROUT CURTAIN (NOT TO SCALE)

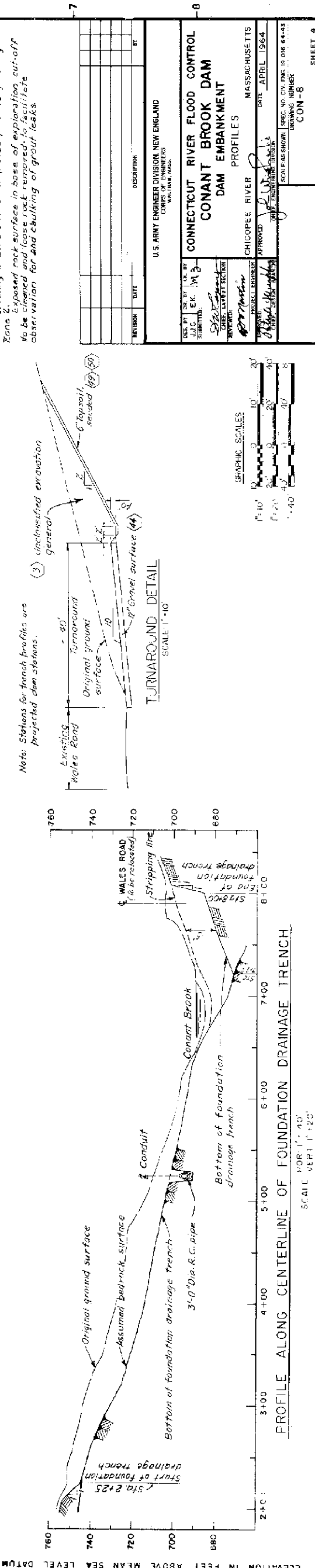


FOUNDATION CUT-OFF TRENCH (NOT TO SCALE)

NOTES
Grouting of holes on Line 1 will be completed in any Zone or Section prior to grouting respective Zone or Section in Line 2 Notes.
Zone 1 grouting in Zone 1 to be completed prior to grouting Zone 2.
Zone 2 grouting in base of exploration cut-off to be completed and loose rock removed to facilitate observation for and chalking of grout leaks.

PROFILE ALONG CENTERLINE OF FOUNDATION CUTOFF TRENCH

SCALE: HOR. 1"=40'
VERT. 1"=20'

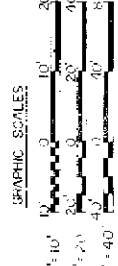
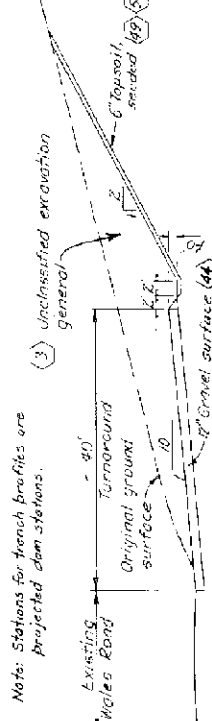


PROFILE ALONG CENTERLINE OF FOUNDATION DRAINAGE TRENCH

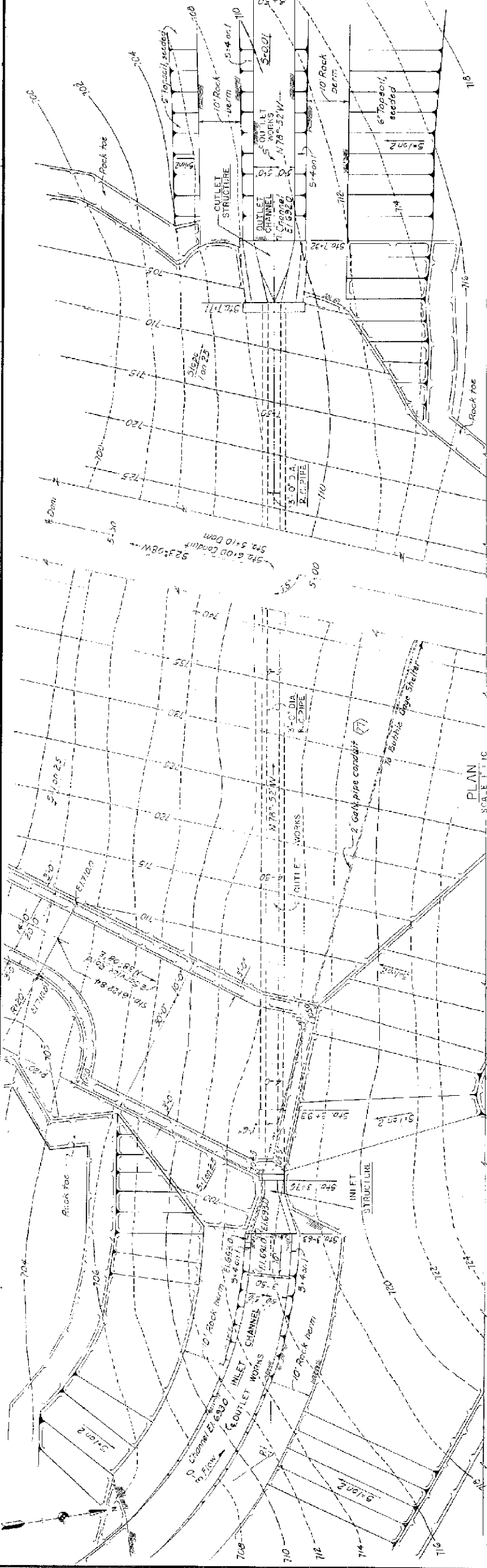
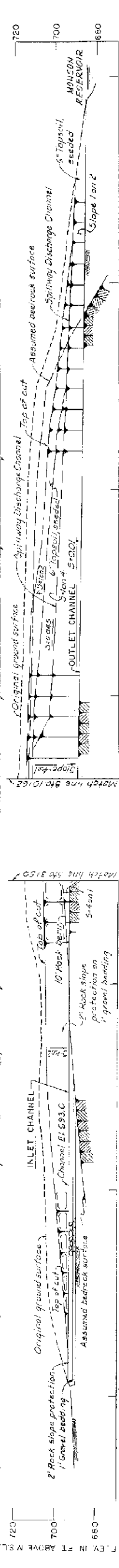
SCALE: HOR. 1"=40'
VERT. 1"=20'

TURNAROUND DETAIL

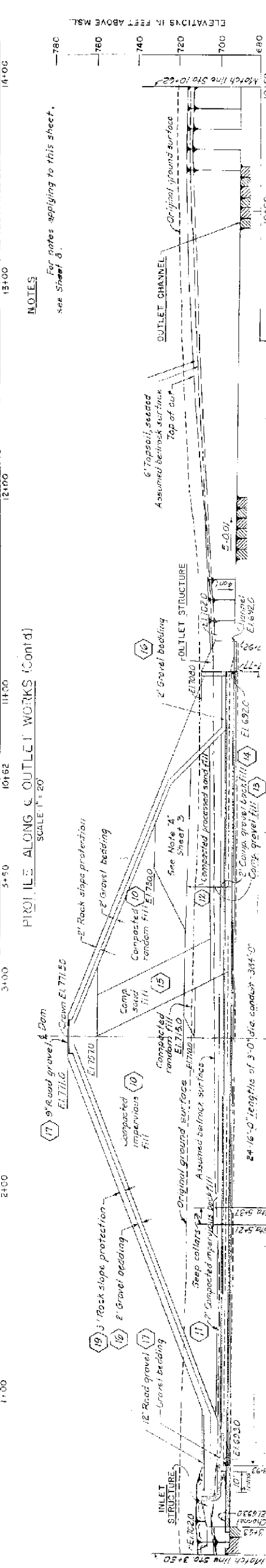
SCALE 1"=40'



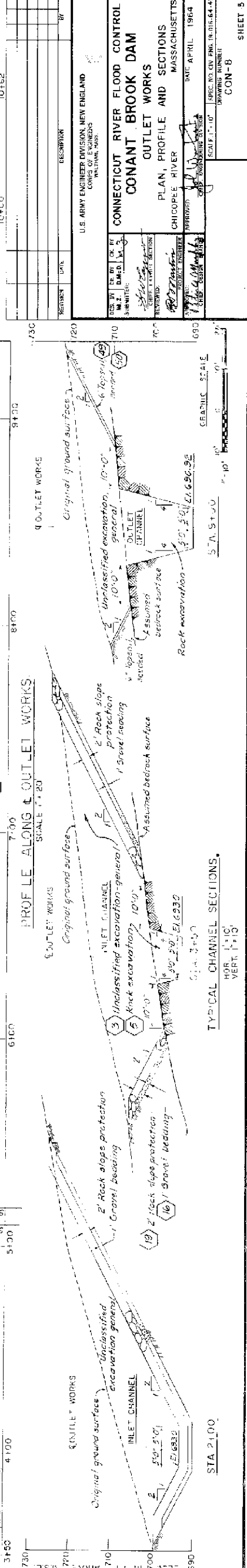
| | |
|--|----------------------------------|
| U.S. ARMY ENGINEER DIVISION NEW ENGLAND CORPS OF ENGINEERS WALTON, MASS. | |
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM DAM EMBANKMENT | |
| PROFILES | |
| DESIGNED BY J.L.C. E.C. M. 3 | CHICHOPEE RIVER MASSACHUSETTS |
| APPROVED BY [Signature] | DATE APRIL 1964 |
| SPEC. NO. CV. ENG. 19.016 6-4-63 DRAWING NUMBER CON-8 | |
| SHEET 4 | |


$$\frac{PLAN}{SCA-EI} = 1$$


PROFILE ALONG & OUTLET WORKS (Contd.)



PROFILE ALONG ϵ OUTLET WORKS.



TYPICAL CHANNEL SECTIONS.

| | HOR. | VERT. | $\lambda = 10^\circ$ | $\lambda = 10^\circ$ |
|----|------|-------|----------------------|----------------------|
| 1 | 10 | 10 | 10 | 10 |
| 2 | 20 | 20 | 20 | 20 |
| 3 | 30 | 30 | 30 | 30 |
| 4 | 40 | 40 | 40 | 40 |
| 5 | 50 | 50 | 50 | 50 |
| 6 | 60 | 60 | 60 | 60 |
| 7 | 70 | 70 | 70 | 70 |
| 8 | 80 | 80 | 80 | 80 |
| 9 | 90 | 90 | 90 | 90 |
| 10 | 100 | 100 | 100 | 100 |
| 11 | 110 | 110 | 110 | 110 |
| 12 | 120 | 120 | 120 | 120 |
| 13 | 130 | 130 | 130 | 130 |
| 14 | 140 | 140 | 140 | 140 |
| 15 | 150 | 150 | 150 | 150 |
| 16 | 160 | 160 | 160 | 160 |
| 17 | 170 | 170 | 170 | 170 |
| 18 | 180 | 180 | 180 | 180 |
| 19 | 190 | 190 | 190 | 190 |
| 20 | 200 | 200 | 200 | 200 |
| 21 | 210 | 210 | 210 | 210 |
| 22 | 220 | 220 | 220 | 220 |
| 23 | 230 | 230 | 230 | 230 |
| 24 | 240 | 240 | 240 | 240 |
| 25 | 250 | 250 | 250 | 250 |
| 26 | 260 | 260 | 260 | 260 |
| 27 | 270 | 270 | 270 | 270 |
| 28 | 280 | 280 | 280 | 280 |
| 29 | 290 | 290 | 290 | 290 |
| 30 | 300 | 300 | 300 | 300 |
| 31 | 310 | 310 | 310 | 310 |
| 32 | 320 | 320 | 320 | 320 |
| 33 | 330 | 330 | 330 | 330 |
| 34 | 340 | 340 | 340 | 340 |
| 35 | 350 | 350 | 350 | 350 |
| 36 | 360 | 360 | 360 | 360 |

100

NOTES

For notes applying to this sheet,
see Sheet 8.

[illegible]

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND

CORPS OF ENGINEERS
WALTHAM, MASS.CONNECTICUT RIVER FLOOD CONTROL
CONANT BROOK DAM

CIVIL ET WORKS

OUTLET WORKS
21 211 BOOTH # AND SECTIONS

PLAN, PROFILE AND SECTIONS

PEE RIVER

DATE APRIL 1

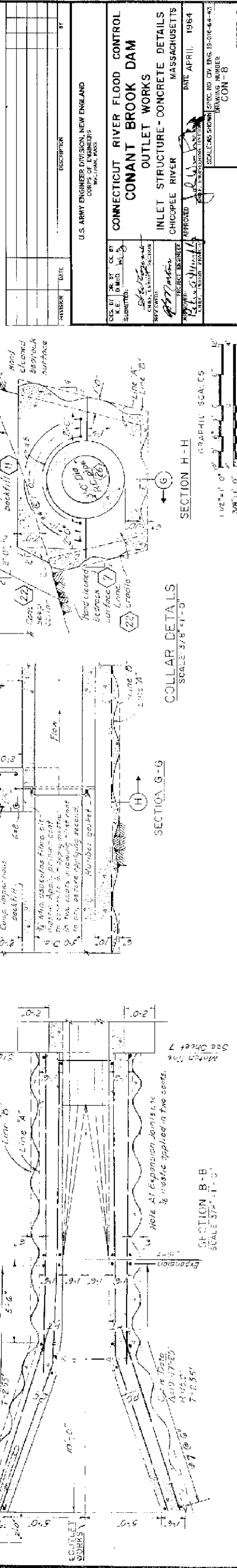
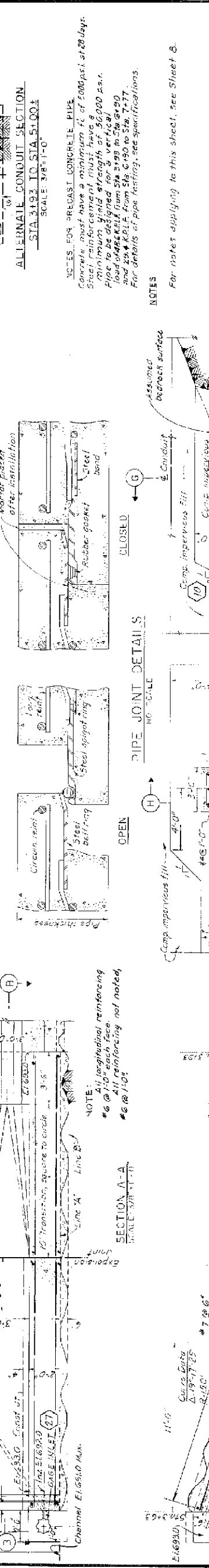
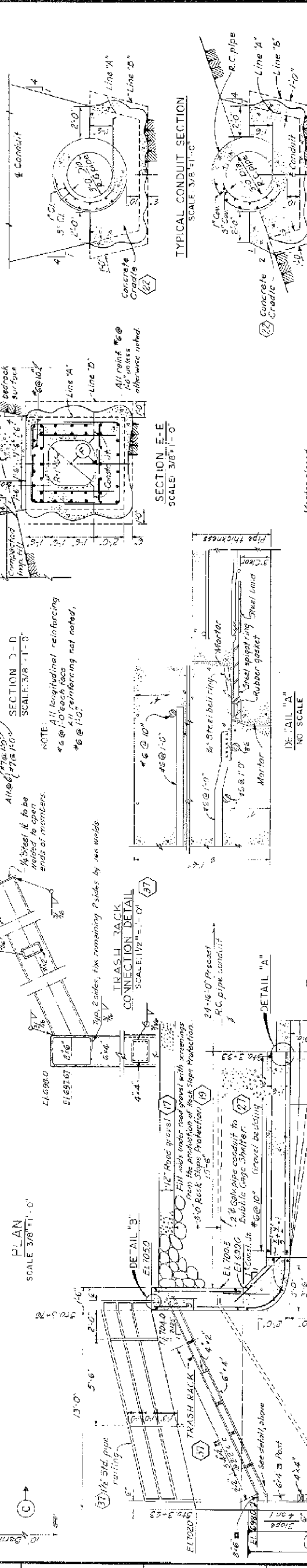
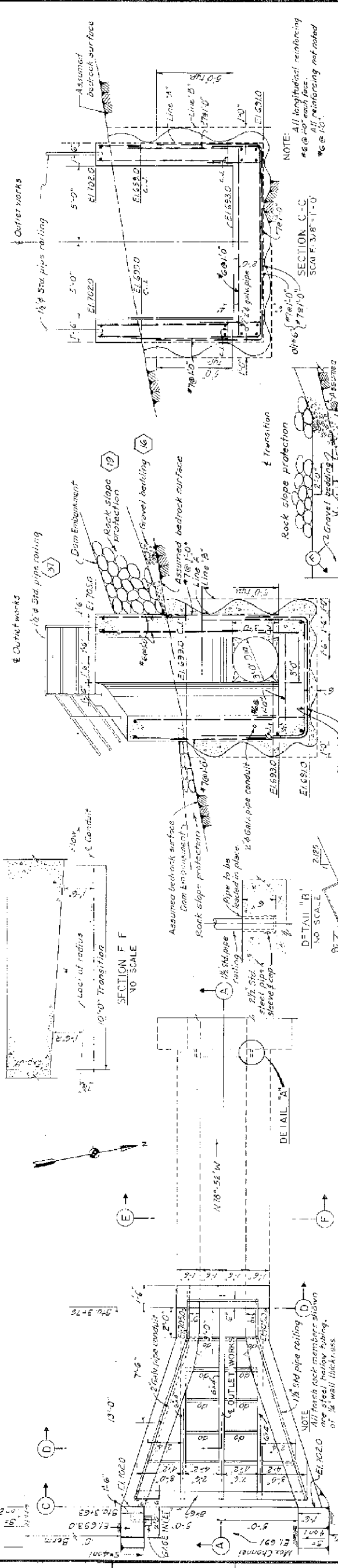
CHIEF, ENGINEERING DIVISION

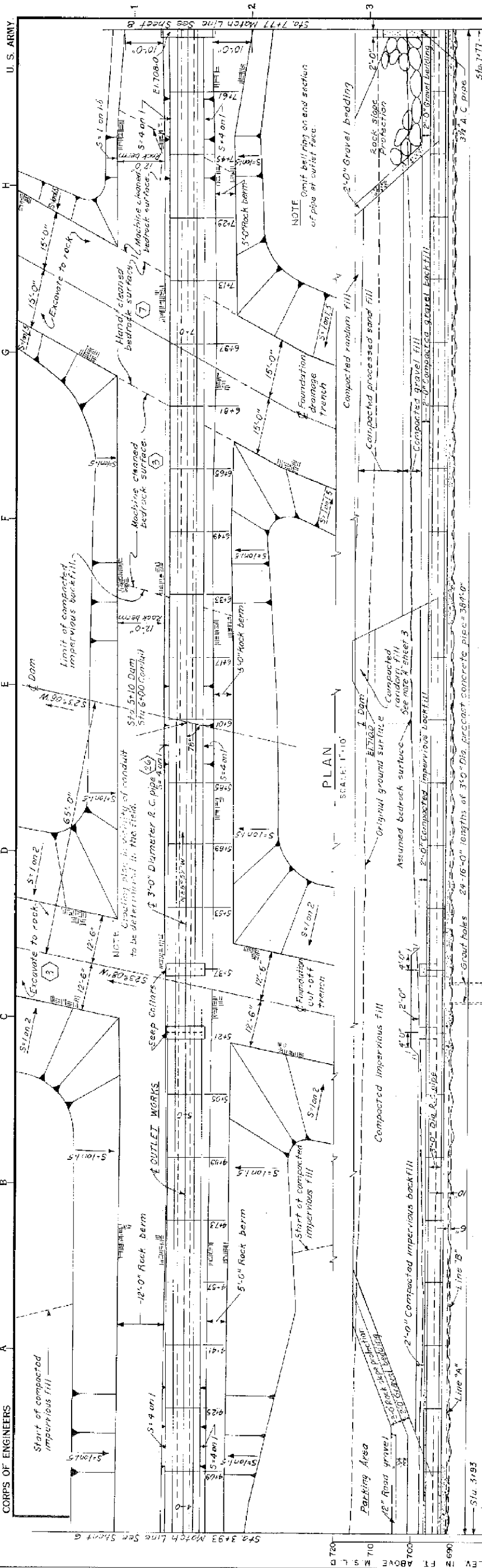
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| SCALE: 1" = 10' | SPEC. NO. CIV. ENG. 18-1311 |
| DRAWING NUMBER: 1180N06000000 | |

CON-8

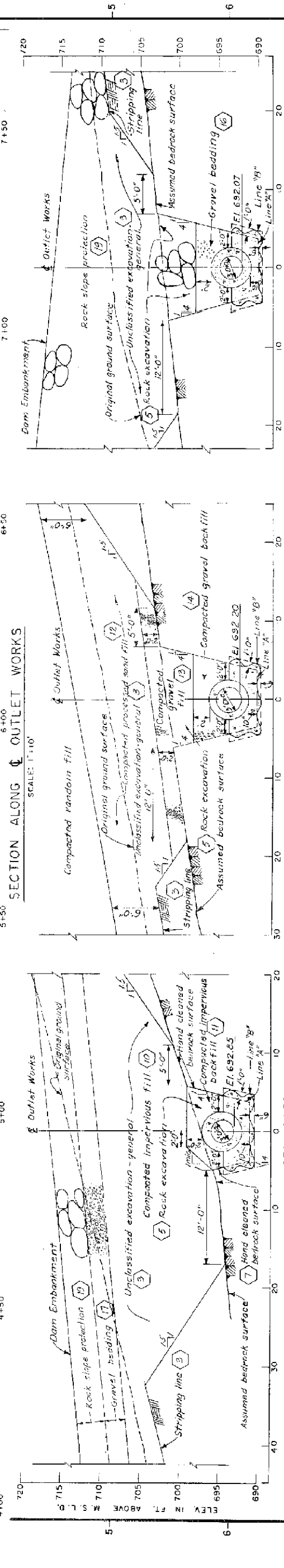
SHE

Table 1

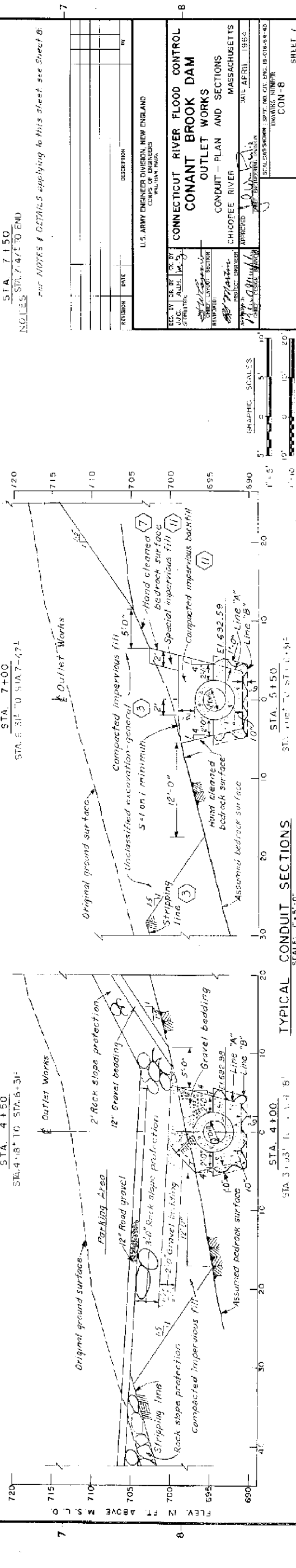




SECTION ALONG OUTLET WORKS



TYPICAL CONDUIT SECTIONS



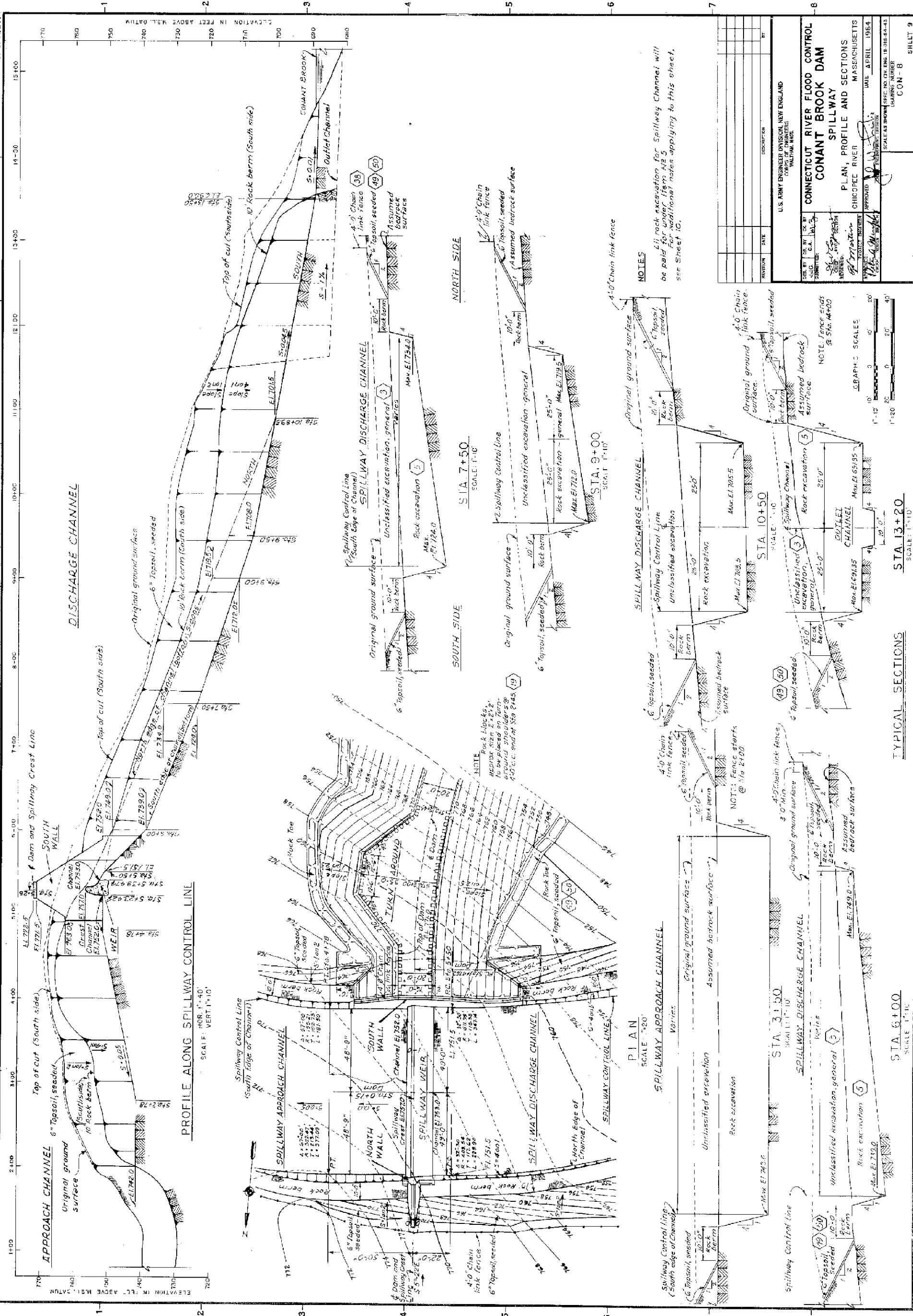
NOTES: 1. DETAILS APPLYING TO THIS SHEET, SEE SHEET 6.

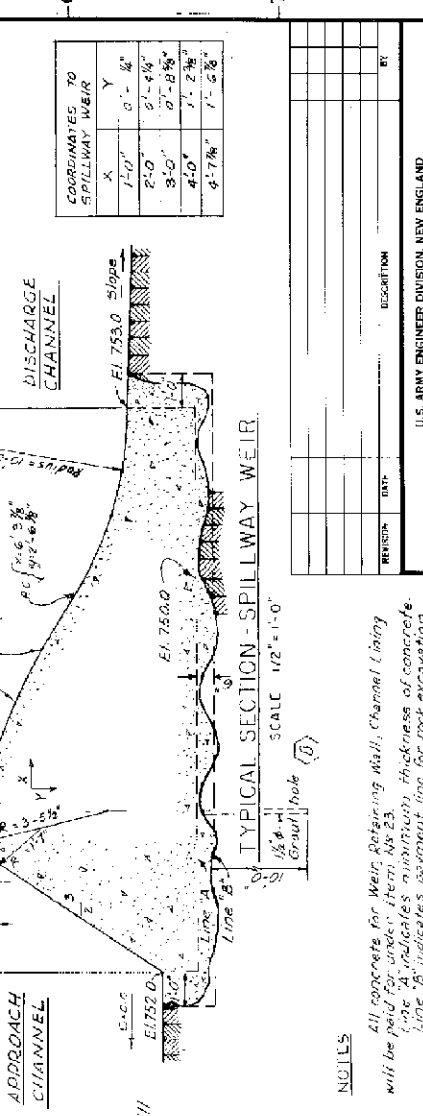
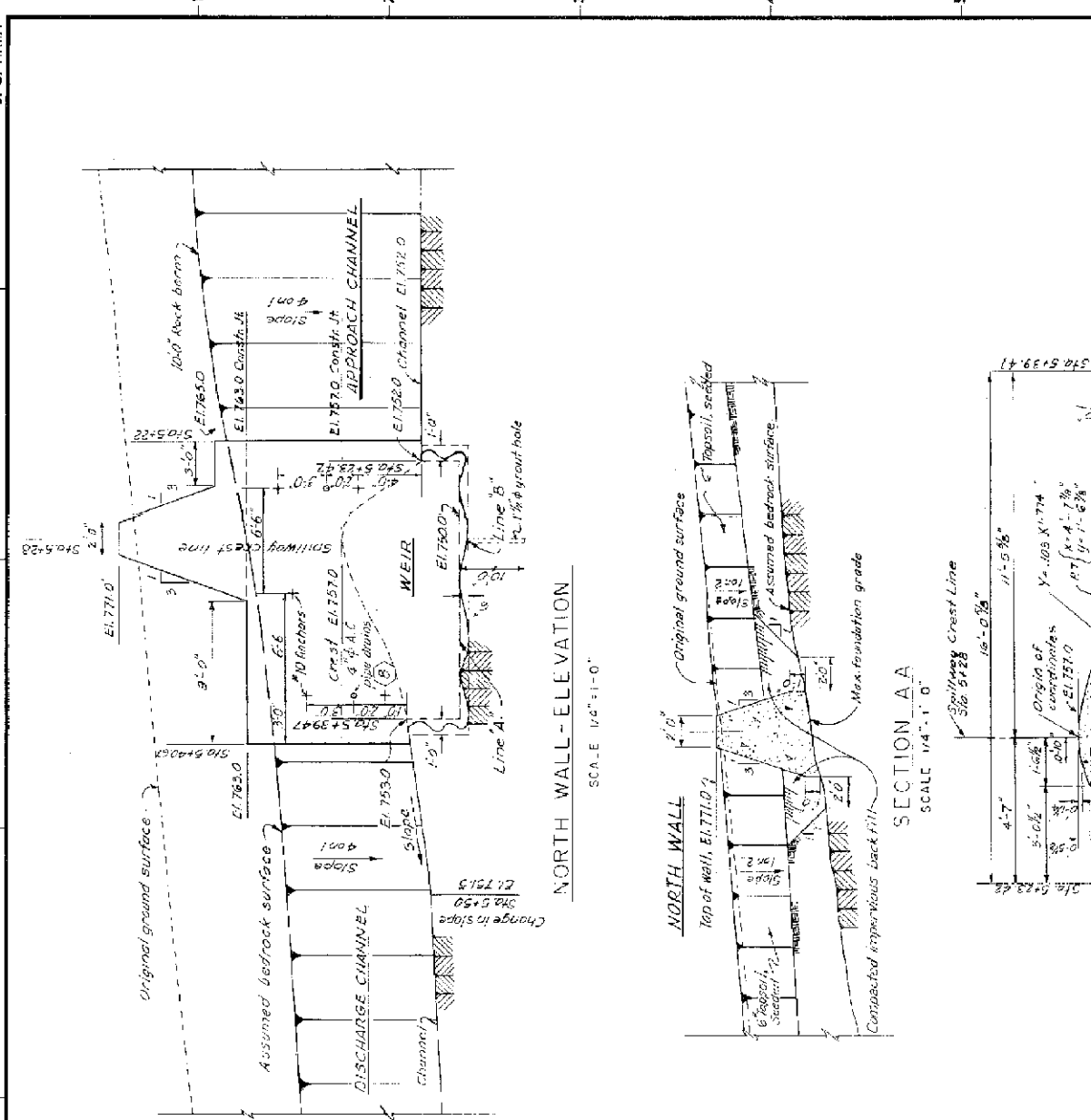
| REVISION | DATE | DESCRIPTION |
|----------|------|-------------|
| 1 | 1954 | AS SHOWN |

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CONDUCT OF WORKS
CONTRACT NO. 1-471-10
PROJECT NO. 1-471-10
CHICOREE RIVER
MASSACHUSETTS
DATE: APRIL 1954
APPROVED: [Signature]
DRAWN: [Signature]
SCALE: 1" = 10'

TYPICAL CONDUIT SECTIONS

SCALE: 1" = 10'

[illegible]



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| EW-5734 | EW-5735 | EW-5736 | EW-5737 | EW-5738 | EW-5739 | EW-5740 | EW-5741 | EW-5742 | EW-5743 | EW-5744 | EW-5745 | EW-5746 | EW-5747 | EW-5748 | EW-5749 | EW-5750 | EW-5751 | EW-5752 | EW-5753 | EW-5754 | EW-5755 | EW-5756 | EW-5757 | EW-5758 | EW-5759 | EW-5760 | EW-5761 | EW-5762 | EW-5763 | EW-5764 | EW-5765 | EW-5766 | EW-5767 | EW-5768 | EW-5769 | EW-5770 | EW-5771 | EW-5772 | EW-5773 | EW-5774 | EW-5775 | EW-5776 | EW-5777 | EW-5778 | EW-5779 | EW-5780 | EW-5781 | EW-5782 | EW-5783 | EW-5784 | EW-5785 | EW-5786 | EW-5787 | EW-5788 | EW-5789 | EW-5790 | EW-5791 | EW-5792 | EW-5793 | EW-5794 | EW-5795 | EW-5796 | EW-5797 | EW-5798 | EW-5799 | EW-5800 | EW-5801 | EW-5802 | EW-5803 | EW-5804 | EW-5805 | EW-5806 | EW-5807 | EW-5808 | EW-5809 | EW-5810 | EW-5811 | EW-5812 | EW-5813 | EW-5814 | EW-5815 | EW-5816 | EW-5817 | EW-5818 | EW-5819 | EW-5820 | EW-5821 | EW-5822 | EW-5823 | EW-5824 | EW-5825 | EW-5826 | EW-5827 | EW-5828 | EW-5829 | EW-5830 | EW-5831 | EW-5832 | EW-5833 | EW-5834 | EW-5835 | EW-5836 | EW-5837 | EW-5838 | EW-5839 | EW-5840 | EW-5841 | EW-5842 | EW-5843 | EW-5844 | EW-5845 | EW-5846 | EW-5847 | EW-5848 | EW-5849 | EW-5850 | EW-5851 | EW-5852 | EW-5853 | EW-5854 | EW-5855 | EW-5856 | EW-5857 | EW-5858 | EW-5859 | EW-5860 | EW-5861 | EW-5862 | EW-5863 | EW-5864 | EW-5865 | EW-5866 | EW-5867 | EW-5868 | EW-5869 | EW-5870 | EW-5871 | EW-5872 | EW-5873 | EW-5874 | EW-5875 | EW-5876 | EW-5877 | EW-5878 | EW-5879 | EW-5880 | EW-5881 | EW-5882 | EW-5883 | EW-5884 | EW-5885 | EW-5886 | EW-5887 | EW-5888 | EW-5889 | EW-5890 | EW-5891 | EW-5892 | EW-5893 | EW-5894 | EW-5895 | EW-5896 | EW-5897 | EW-5898 | EW-5899 | EW-5900 | EW-5901 | EW-5902 | EW-5903 | EW-5904 | EW-5905 | EW-5906 | EW-5907 | EW-5908 | EW-5909 | EW-5910 | EW-5911 | EW-5912 | EW-5913 | EW-5914 | EW-5915 | EW-5916 | EW-5917 | EW-5918 | EW-5919 | EW-5920 | EW-5921 | EW-5922 | EW-5923 | EW-5924 | EW-5925 | EW-5926 | EW-5927 | EW-5928 | EW-5929 | EW-5930 | EW-5931 | EW-5932 | EW-5933 | EW-5934 | EW-5935 | EW-5936 | EW-5937 | EW-5938 | EW-5939 | EW-5940 | EW-5941 | EW-5942 | EW-5943 | EW-5944 | EW-5945 | EW-5946 | EW-5947 | EW-5948 | EW-5949 | EW-5950 | EW-5951 | EW-5952 | EW-5953 | EW-5954 | EW-5955 | EW-5956 | EW-5957 | EW-5958 | EW-5959 | EW-5960 | EW-5961 | EW-5962 | EW-5963 | EW-5964 | EW-5965 | EW-5966 | EW-5967 | EW-5968 | EW-5969 | EW-5970 | EW-5971 | EW-5972 | EW-5973 | EW-5974 | EW-5975 | EW-5976 | EW-5977 | EW-5978 | EW-5979 | EW-5980 | EW-5981 | EW-5982 | EW-5983 | EW-5984 | EW-5985 | EW-5986 | EW-5987 | EW-5988 | EW-5989 | EW-5990 | EW-5991 | EW-5992 | EW-5993 | EW-5994 | EW-5995 | EW-5996 | EW-5997 | EW-5998 | EW-5999 | EW-6000 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

5, ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WINTHAM, MASS.

CONNECTICUT RIVER FLOOD CONTROL
CONANT BROOK DAM
SOIL I WAY

SPILLWAY
CONCRETE DETAILS NO. 1

MASSACHUSETTS
RIVER
DATE APRIL 1964

| | |
|----------------|---------------------------------|
| SCALE AS SHOWN | SHEET NO. CIV. ENG. 19-016-64-4 |
| DRAWING NUMBER | |

CON - 8

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | |

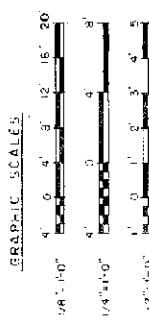
WELLS

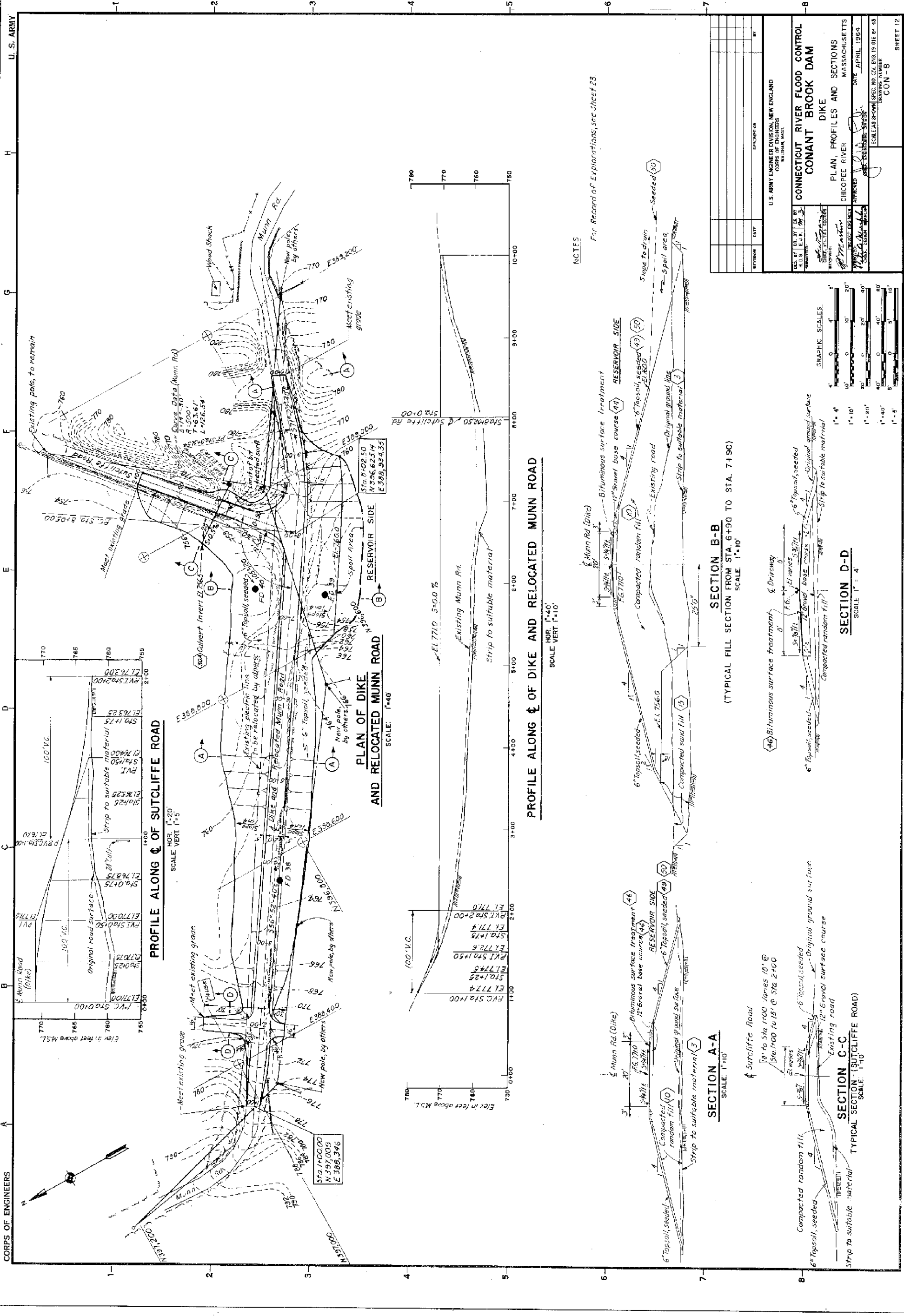
All concrete for Wells Retaining Wall, Channel Lining will be under item A-23.

Line A indicates minimum thickness of concrete. Line B indicates payment line for rock excavation and concrete.

All exposed edges of concrete, including tops of wells to be formed 1:2½.

All joints in the face of concrete walls against which fills are to be placed shall be made flush.





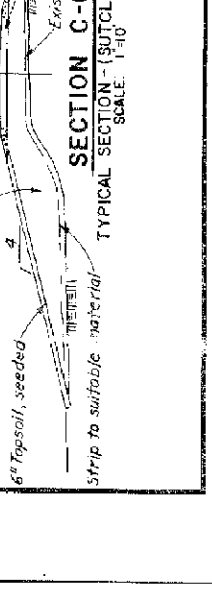
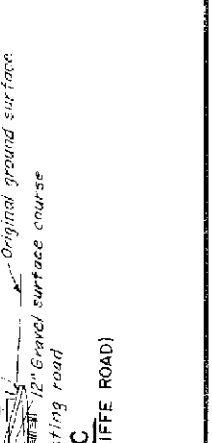
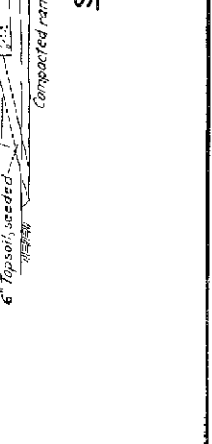
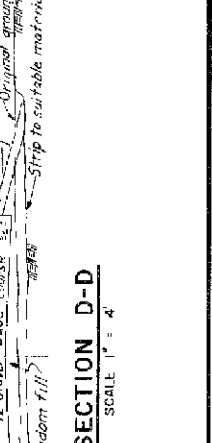
U. S. ARMY
CORPS OF ENGINEERS

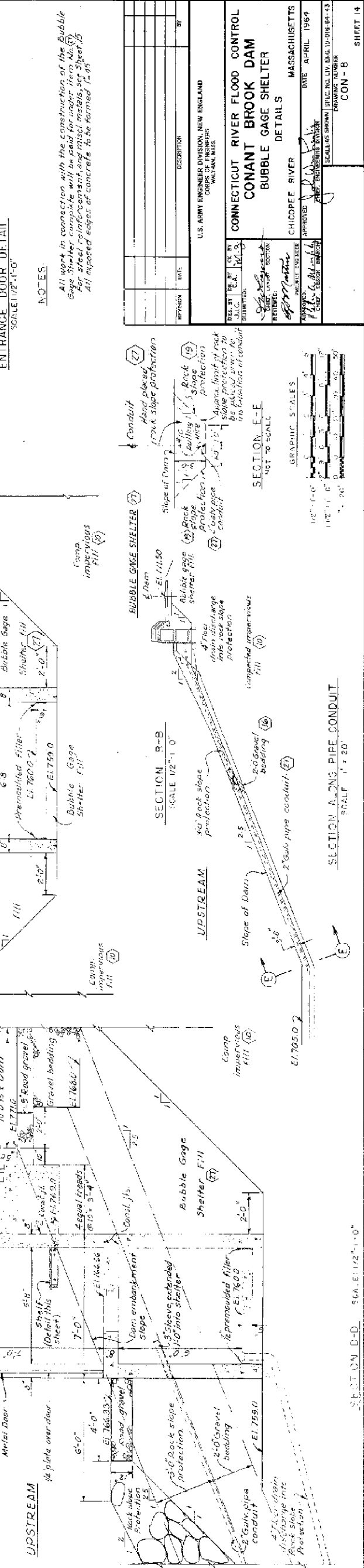
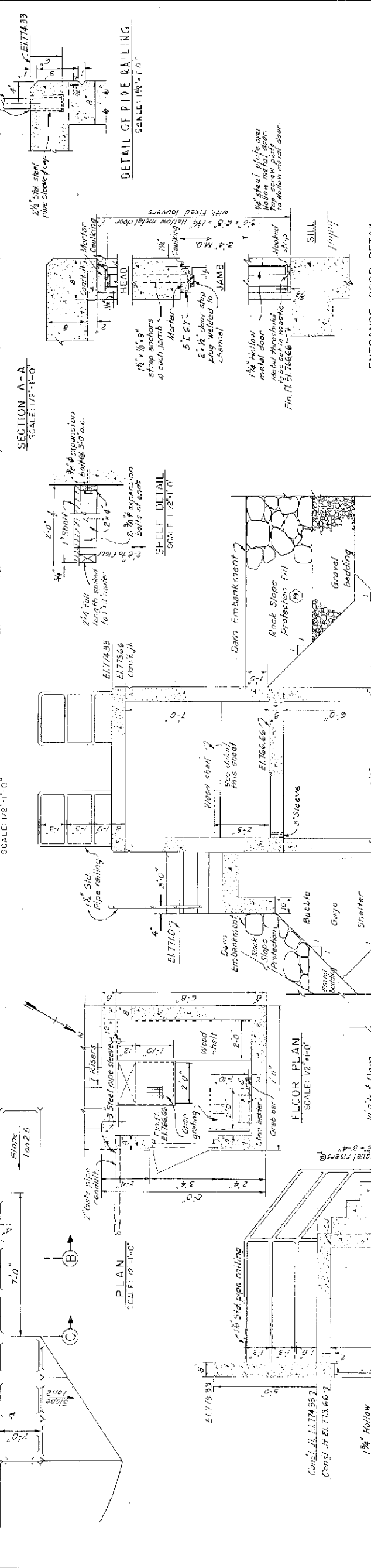
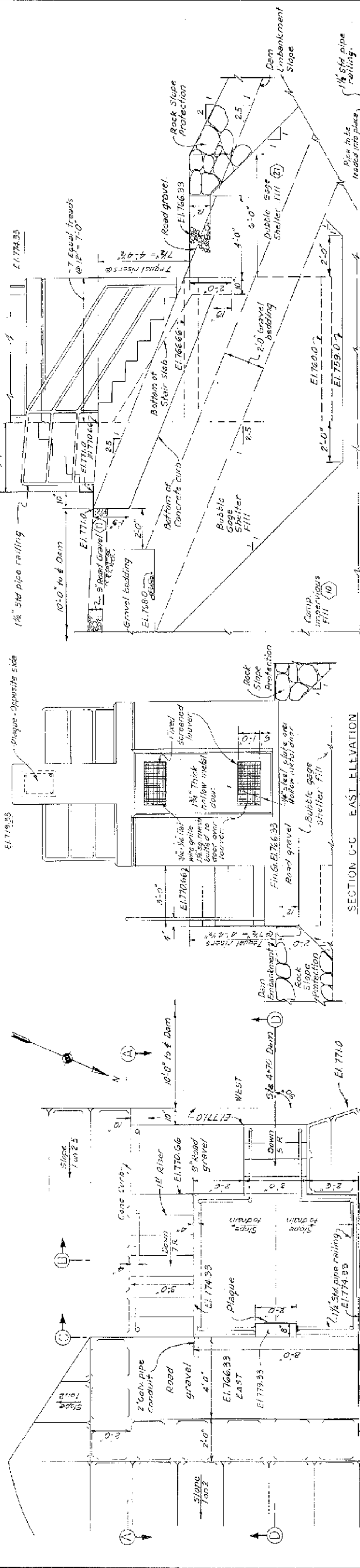
NOTES
For Record of Explorations, see Sheet 23.

| | | | |
|--|--|-----------------------------|--|
| DES BY: [Signature] H.O.G. E.A.K. [Signature] | | DATE: [Signature] | |
| CHECKED BY: [Signature] | | DATE: [Signature] | |
| APPROVED BY: [Signature] | | DATE: [Signature] | |
| SCALE: AS SHOWN | | SPEC. NO. C.E. 15-016-64-43 | |
| DRAWING NUMBER | | CON - 8 | |
| SHEET 12 | | | |

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALHAM, MASS.

CONNECTICUT RIVER FLOOD CONTROL
CONANT BROOK DAM
DIKE
PLAN, PROFILES AND SECTIONS
CHICOPEE RIVER
MASSACHUSETTS
APRIL 1964





DETAIL OF PIPE RAILING
SCALE: 1/2" = 1'-0"

ENTRANCE DOOR DETAIL
SCALE: 1/2" = 1'-0"

SHELF DETAIL
SCALE: 1/2" = 1'-0"

PLAN
SCALE: 1/2" = 1'-0"

FLOOR PLAN
SCALE: 1/2" = 1'-0"

UPSTREAM

UPSTREAM

SECTION A-B
SCALE: 1/2" = 1'-0"

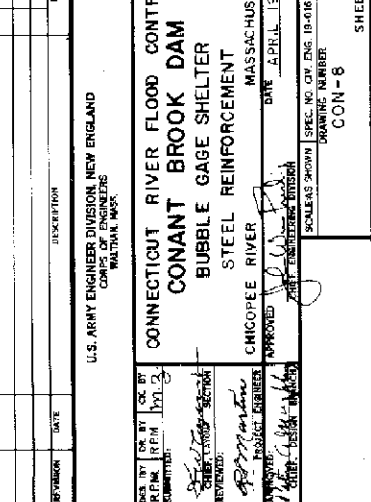
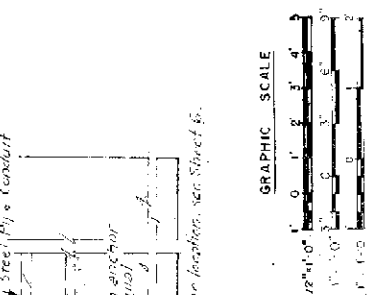
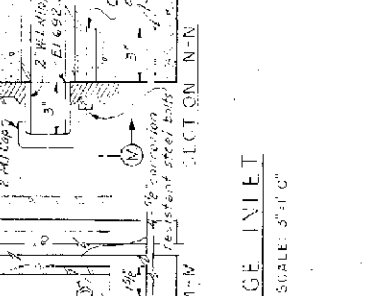
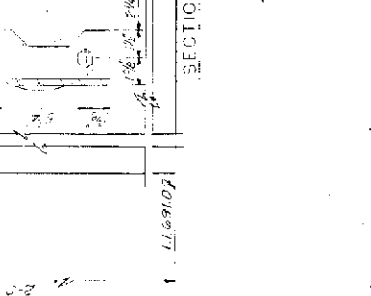
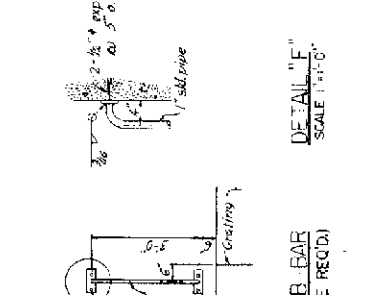
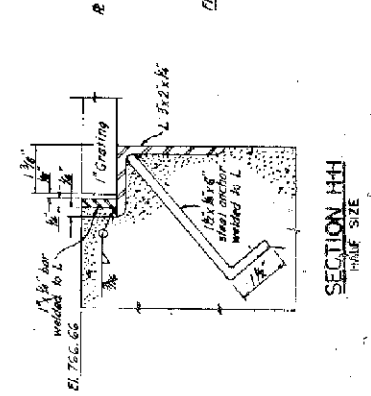
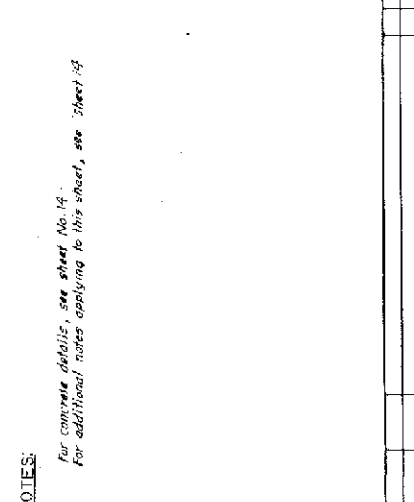
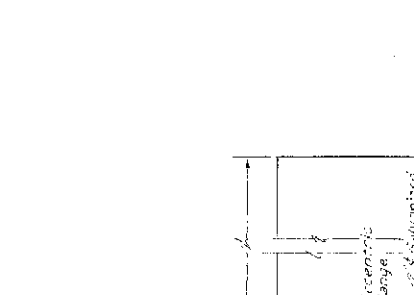
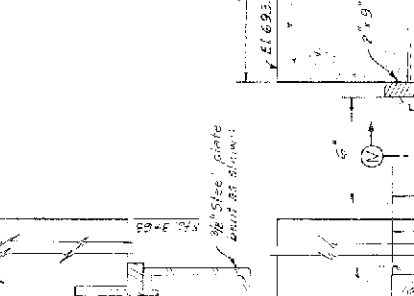
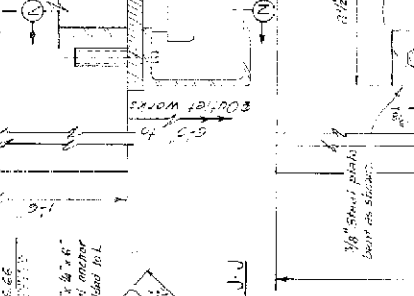
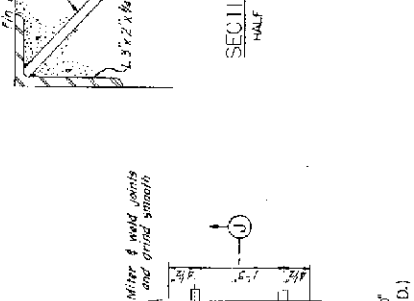
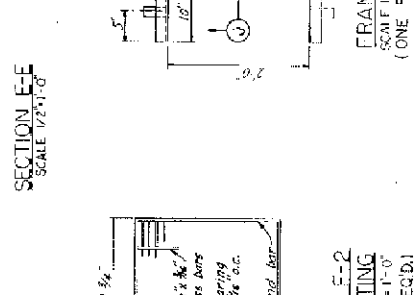
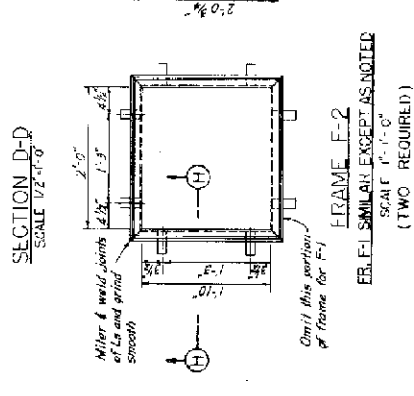
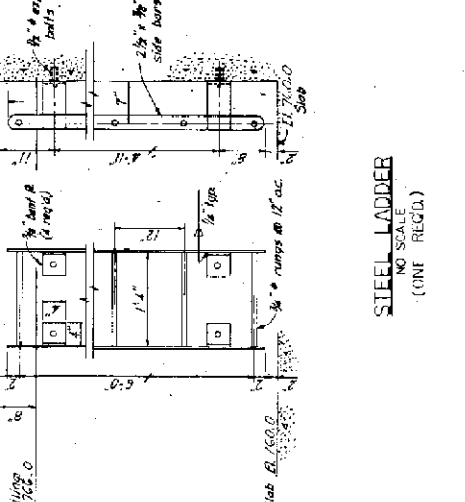
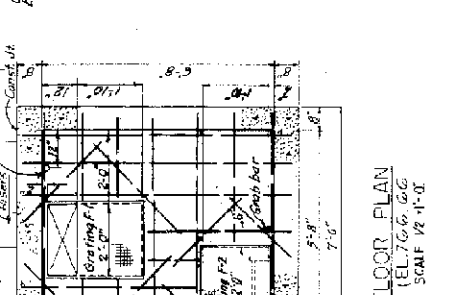
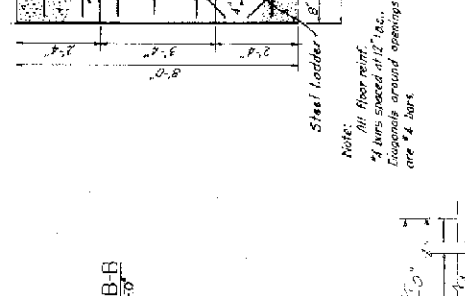
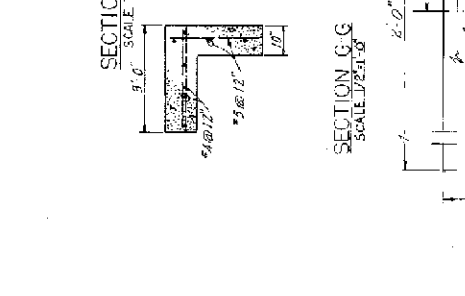
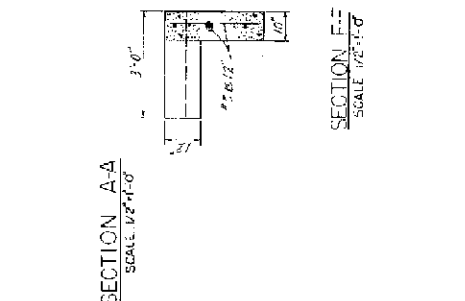
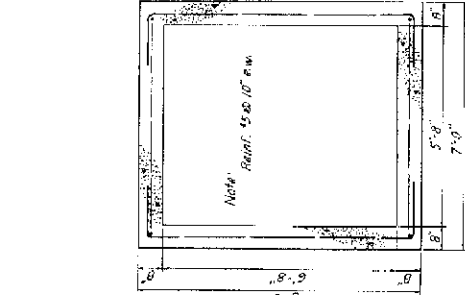
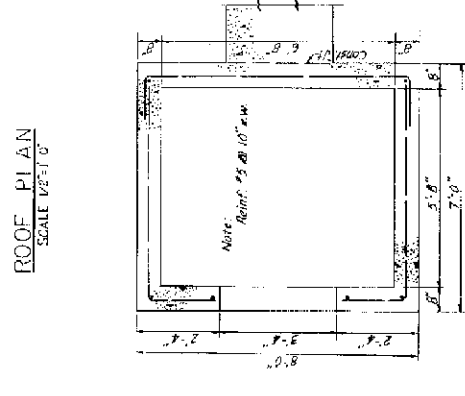
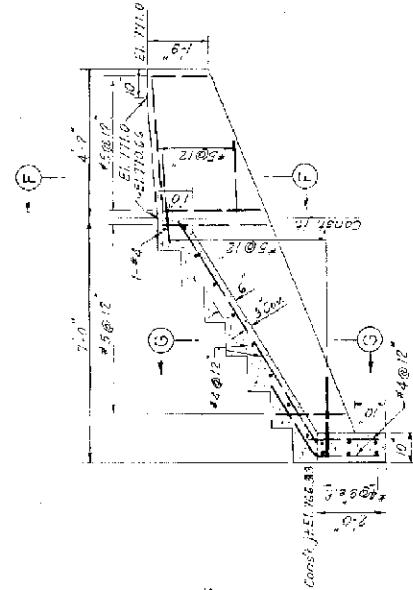
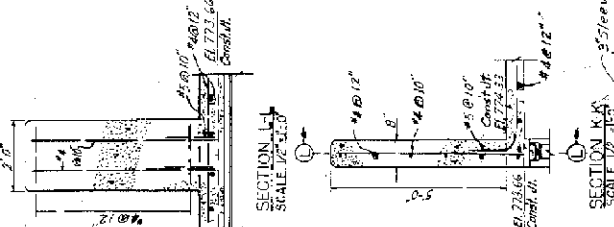
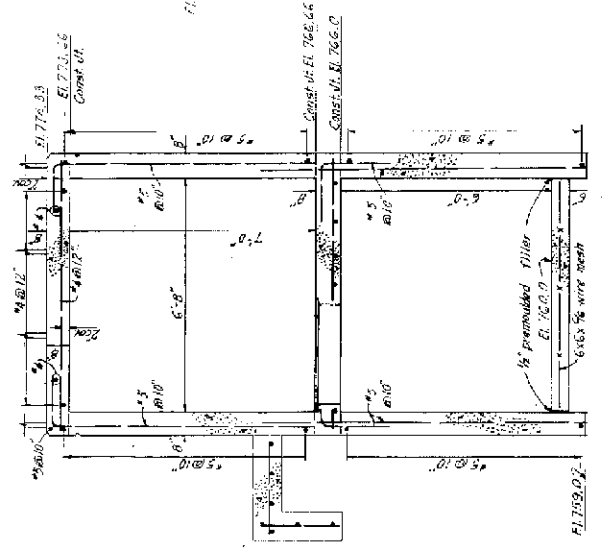
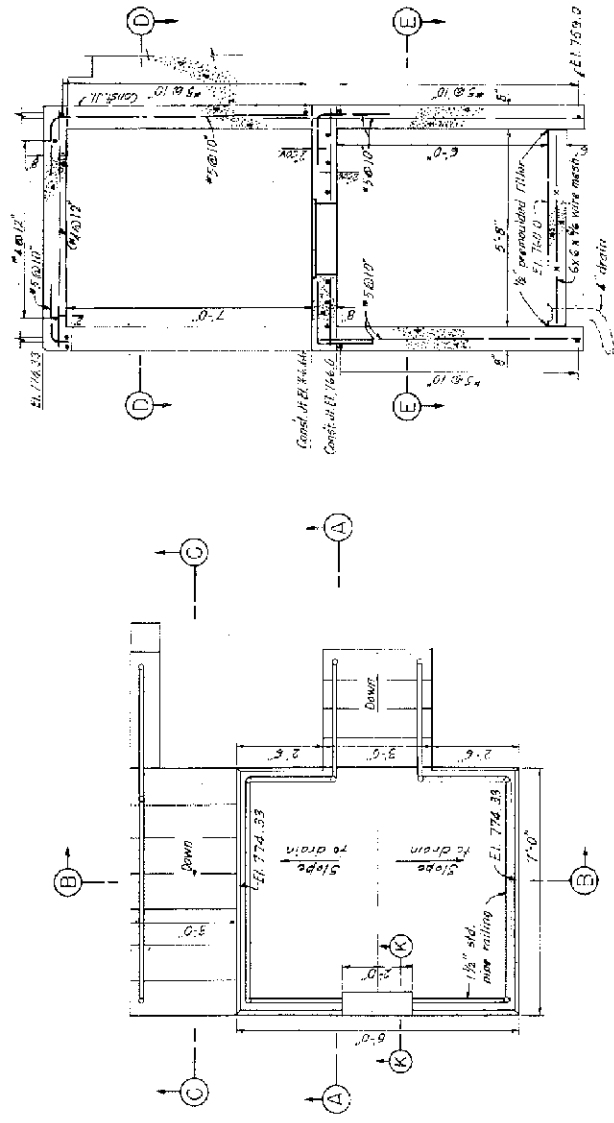
SECTION E-E
SCALE: 1/2" = 1'-0"

SECTION D-D
SCALE: 1/2" = 1'-0"

NOTES:
All work in connection with the construction of the Bubble Gate Shelter complete will be paid for under item No. 17, for steel reinforcement and misc. metals, see Sheet 15. All exposed edges of concrete to be formed 1/2" as shown.

GRAPHIC SCALES
1" = 10' 0"
1" = 20' 0"
1" = 30' 0"
1" = 40' 0"
1" = 50' 0"

| | | | |
|--|--------------------|--|--------------------|
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM BUBBLE GATE SHELTER DETAILS | | CHICOPEE RIVER MASSACHUSETTS | |
| DESIGNED BY U.S. ARMY ENGINEER DISTRICT NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | DATE APRIL 1964 | APPROVED BY U.S. ARMY ENGINEER DISTRICT NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | DATE APRIL 1964 |
| DRAWN BY U.S. ARMY ENGINEER DISTRICT NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | | SCALE AS SHOWN SHEET NO. 15 OF 15 DRAWING NUMBER CON - B | |



STEEL LADDER
NO SCALE
(CONT. REQ'D.)

FLOOR PLAN
(EL. 766.66)
SCALE 1/2" = 1'-0"

*4 bars spaced at 12" o.c.,
Diagonals around opening
are #4 bars.

$$\frac{0.01}{0.01} = 1$$

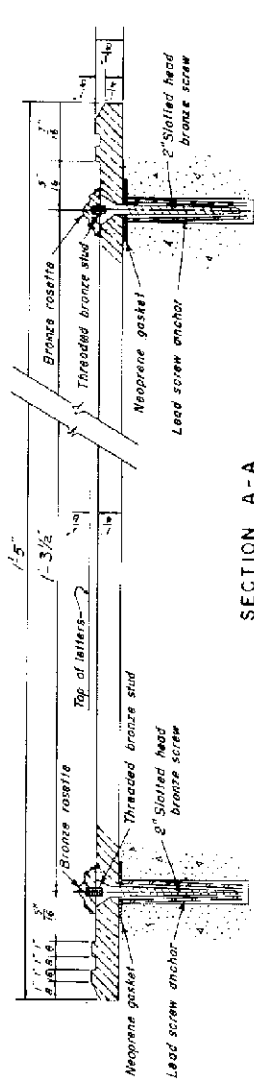
1

1000

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

NOTES:

[illegible]

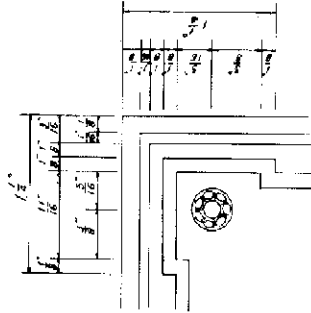


NOTE: Threaded stud shall be dipped in an approved epoxy adhesive immediately prior to being inserted into the rosetta and screw.

SECTION A-A
NOT TO SCALE



SECTION 8 - 8
NOT TO SCALE



DETAIL "B"
NOT TO SCALE

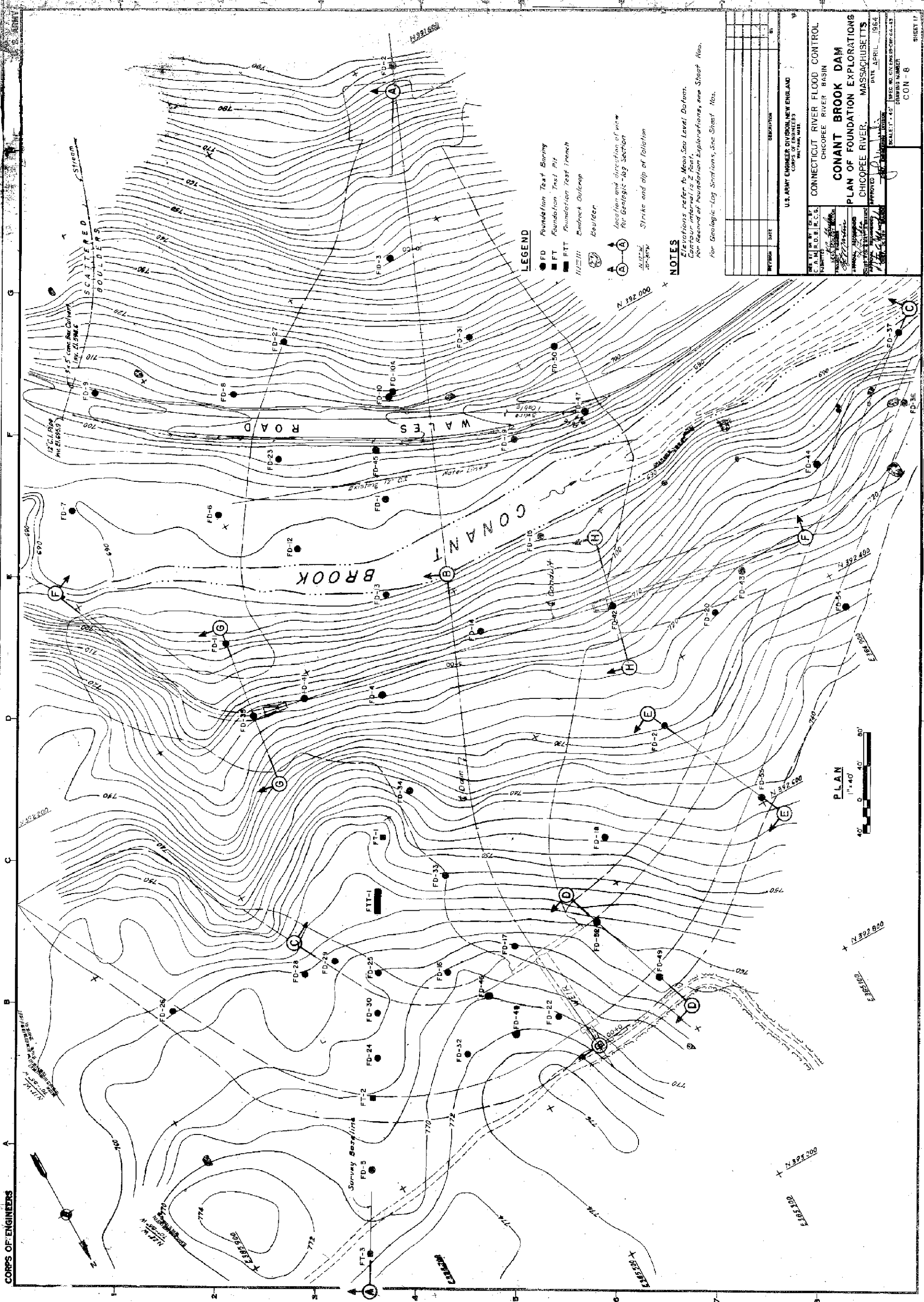
NOTE:

Names of Division Engineer and Resident Engineer will be furnished at a later date

[illegible]PLAQUE

SCALE: FULL SIZE

| | |
|------------|---|
| Material | Cast bronze |
| Finish | Polished and polished to a bright finish with beveled edge |
| Background | Granite or sand finish |
| Letters | Roman style, raised a minimum of 1/8" and finished, flat faced and polished to a bright finish. Manufacturers' standard letter styles may be used subject to the approval of the Division Engineer. |



NOTES

Elevations refer to Mean Sea Level Datum.
Contour interval is 2 feet.
For Record of Foundation Explorations, see Sheet Nos.
for Geologic-Log Sections, See Sheet Nos.

[illegible]

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
Y043 = HAM. MASS

CONNECTICUT RIVER FLOOD CONTROL,
CHICOPEE RIVER BASIN

**CONANT BROOK DAM
PLAN OF FOUNDATION EXPLORATIONS
CHICOPEE RIVER. MASSACHUSETTS**

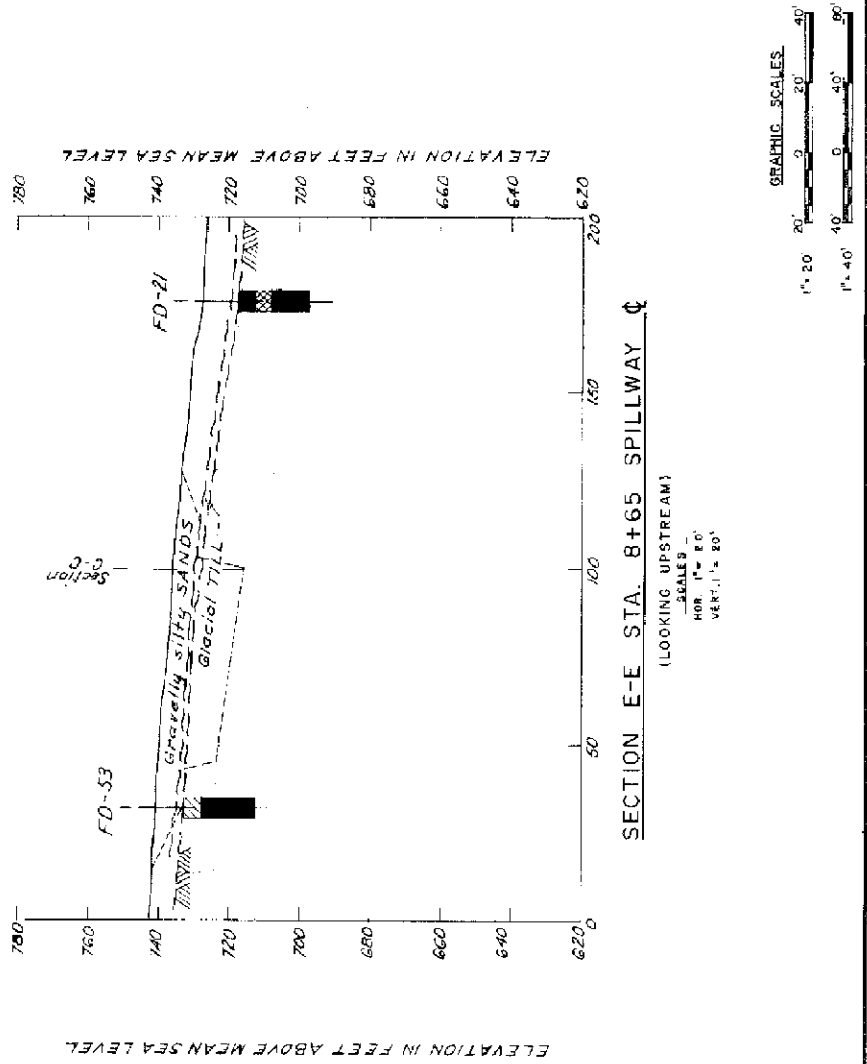
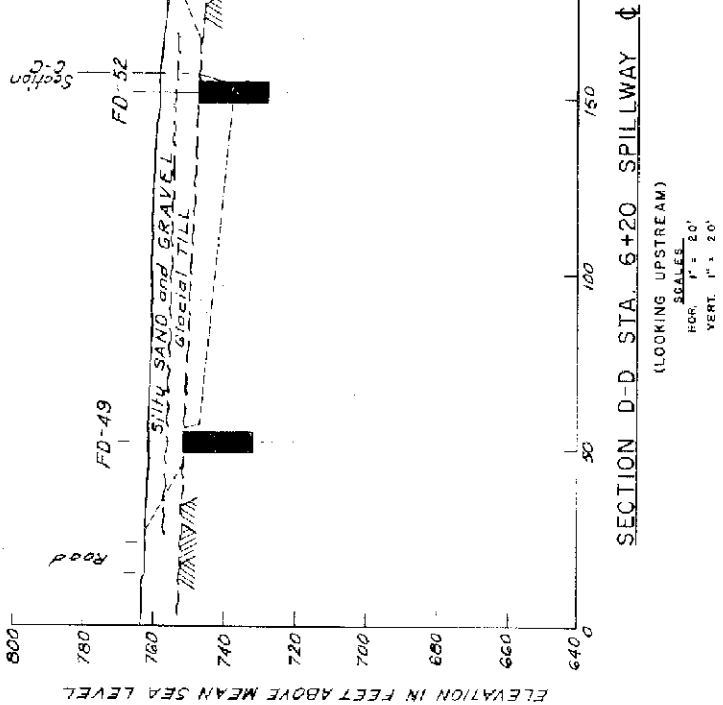
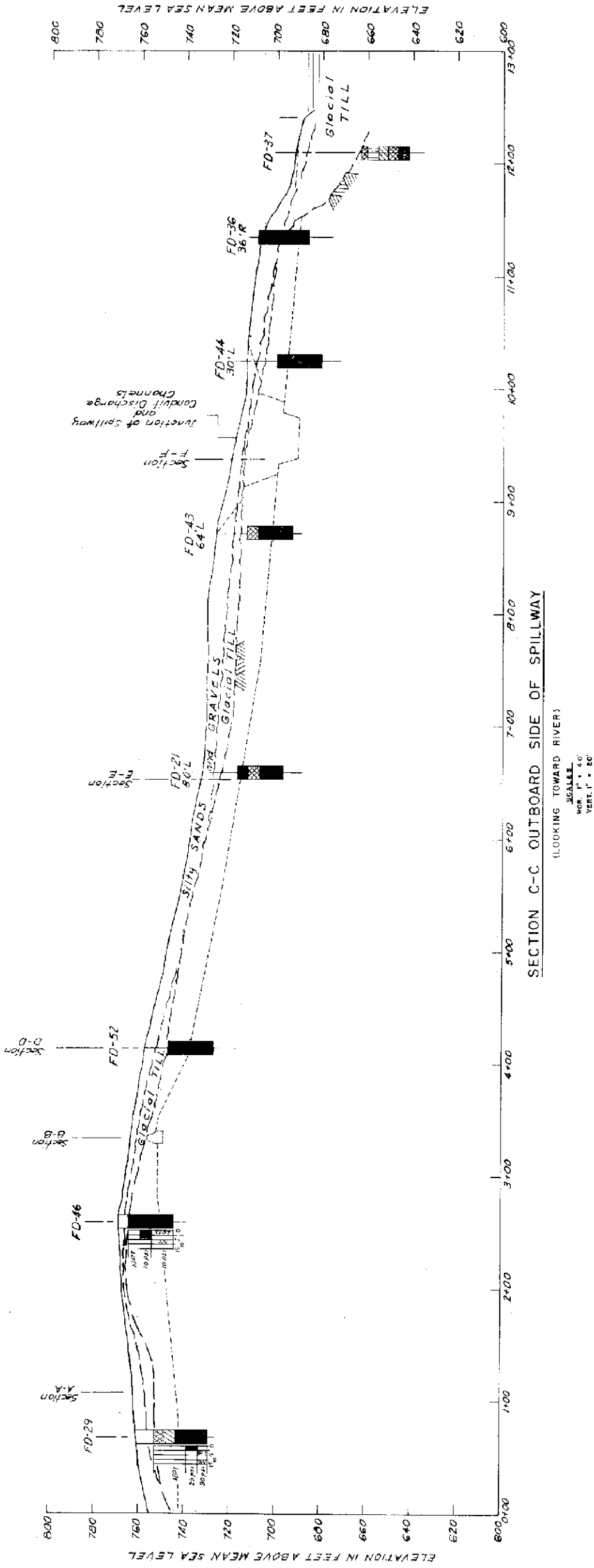
APPROVED _____ DATE APRIL 1964

SCALE: 1" = 40' SPEC NO. CIV ENG 19-016-64-17

DRAWING NUMBER

CON-8
SHEET 17

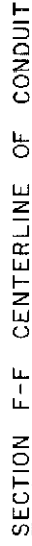
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NOTES

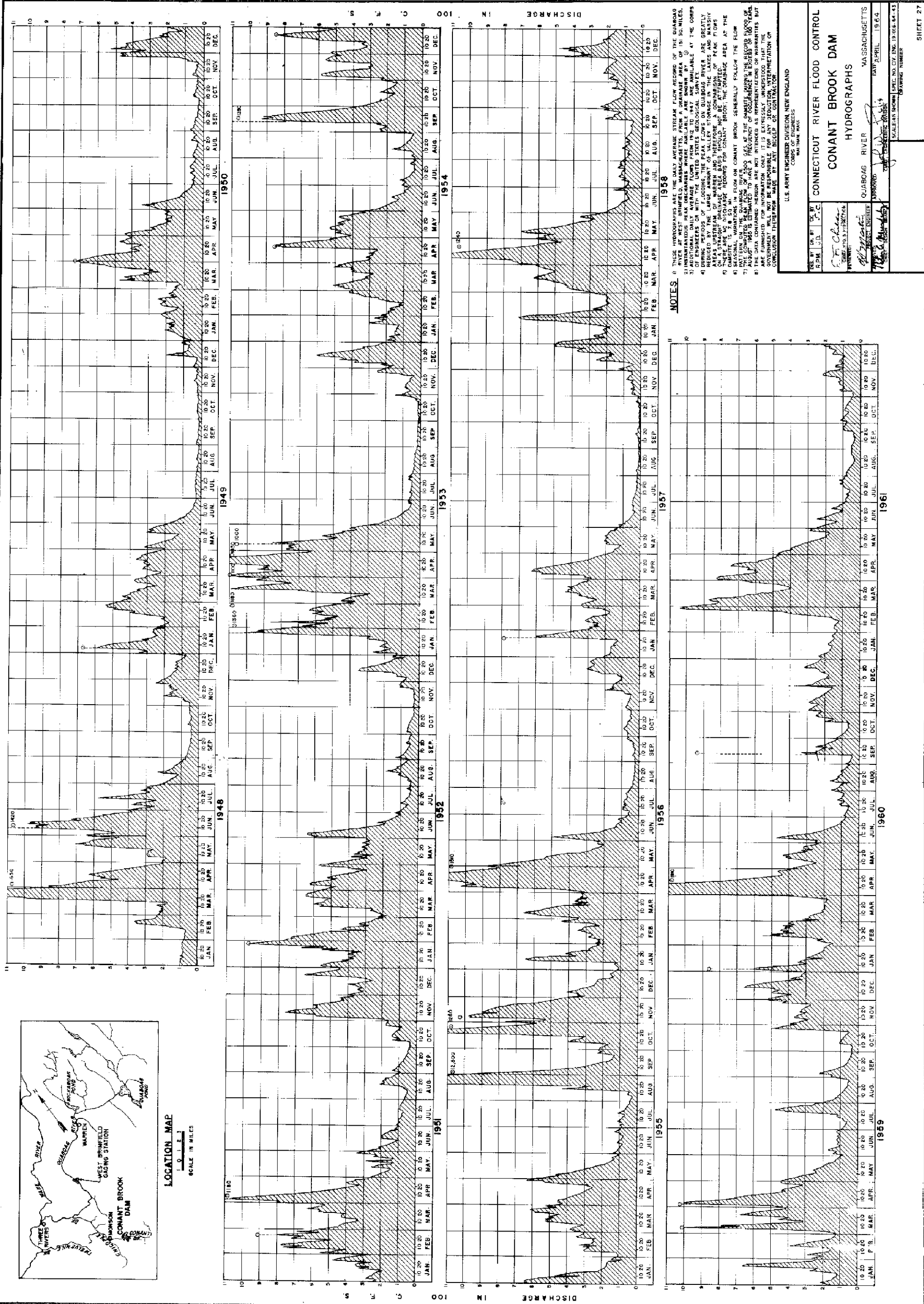
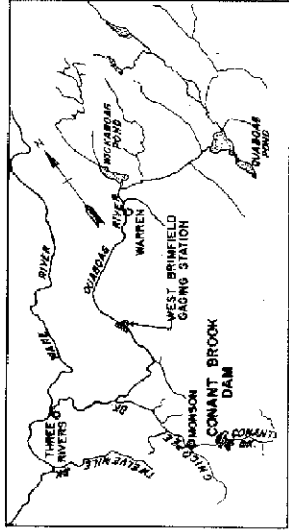
For Record of Foundation Explorations, see Sheet Nos.
For Location of Geologic Log Sections, see Sheet No.
For Legend of Core Borings in Rock, and Notes applicable to Geologic Sections, see Sheet No.

| | |
|--|--------------------|
| U.S. ARMY ENGINEER DIVISION NEW ENGLAND CORPS OF ENGINEERS WALTON HALL | |
| CONNECTICUT RIVER FLOOD CONTROL CHICOPEE RIVER BASIN CONANT BROOK DAM GEOLOGIC - LOG SECTIONS - SPILLWAY CHICOPEE RIVER, MASSACHUSETTS | |
| DESIGNED BY C. A. M. B. E. C. G. | DATE APRIL 1964 |
| PREPARED BY J. W. L. L. | DATE APRIL 1964 |
| CHECKED BY J. W. L. L. | DATE APRIL 1964 |
| APPROVED BY J. W. L. L. | DATE APRIL 1964 |
| DRAWING NUMBER CON - 8 | |
| SHEET 19 | |



For Record of Foundation Explorations, see Sheet No. 1
For Location of Geologic Log Sections, see Sheet No. 2
For Location of Core Binnings in Rock and Notes applicable to Geologic Sections, see Sheet No. 3

[illegible]



NOTES: 1) THESE HYDROGRAPHS ARE THE DAILY AVERAGE STREAM FLOW RECORD OF THE QUABOG RIVER AT WEST BRIMFIELD, MASSACHUSETTS, FROM A DRAINAGE AREA OF 151.50 SQUARE MILES. 2) INSTANTANEOUS PEAK DISCHARGES WHERE AVAILABLE ARE SHOWN BY A TRIANGLE. 3) OF ENGINEERS OR WITH THE UNITED STATES GEOLOGICAL SURVEY. 4) DURING PERIODS OF FLOODING, THE PEAK FLOWS ON QUABOG RIVER ARE GREATLY INFLUENCED BY THE FLOODING OF THE LAKE AND MARSHY AREA UPSTREAM OF WARREN POND. THEREFORE, THE PEAK FLOWS ON A STRAIGHT DRAINAGE AREA BASIS SHOULD NOT BE ATTEMPTED. 5) DURING THE 1950'S THERE WERE RECORDS FOR CONANT BROOK, THE DRAINAGE AREA AT THE DAM. THESE RECORDS WERE USED TO CORRELATE THE FLOW OF CONANT BROOK WITH THE FLOW OF QUABOG RIVER. 6) SEASONAL VARIATIONS IN FLOW ON CONANT BROOK GENERALLY FOLLOW THE FLOW OF QUABOG RIVER. 7) THE DATA CONTAINED HEREIN ARE NOT INTENDED AS REPRESENTATIONS OF WARRANTIES BUT AS A SUMMARY OF THE DATA AVAILABLE TO THE CORPS OF ENGINEERS. 8) THE DATA WERE OBTAINED FROM THE RECORDS OF THE CORPS OF ENGINEERS, NEW ENGLAND DISTRICT, BOSTON, MASSACHUSETTS. 9) CONCLUSION THEREFROM MADE BY ANY OTHER OR CONTRACTOR.

| | | | |
|----------------------------------|--|----------------------------------|--|
| DES. BY: <i>E. F. Chiles</i> | | CHK. BY: <i>J. C. C.</i> | |
| DATE: <i>APR 1964</i> | | DATE: <i>APR 1964</i> | |
| PROJECT: <i>CONANT BROOK DAM</i> | | PROJECT: <i>CONANT BROOK DAM</i> | |
| DRAWING NO.: <i>1564</i> | | DRAWING NO.: <i>1564</i> | |
| SCALE: <i>AS SHOWN</i> | | SCALE: <i>AS SHOWN</i> | |
| SHEET NO.: <i>27</i> | | SHEET NO.: <i>27</i> | |

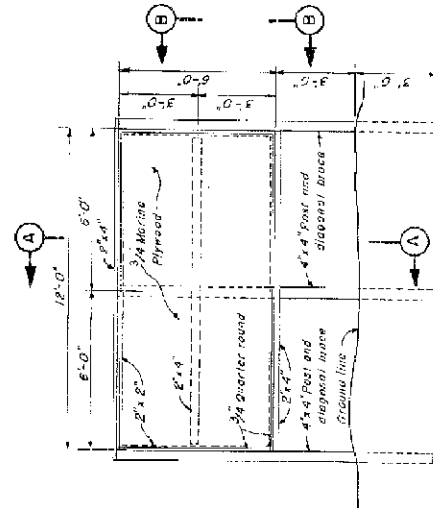
CONANT BROOK DAM

(CONTRACTOR'S NAME) FOR

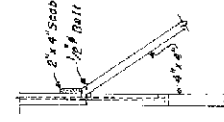
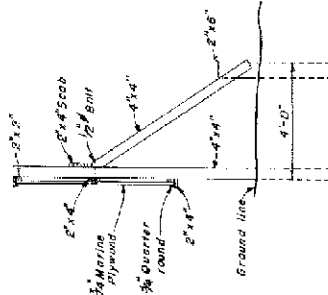
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND

SCALE 3"=1'-0"

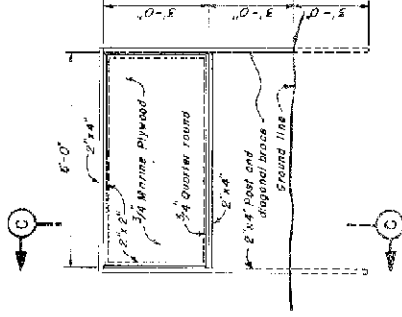
NOTE: This elevation is of a 3' x 6' sign.
See specifications for size required
under this contract.



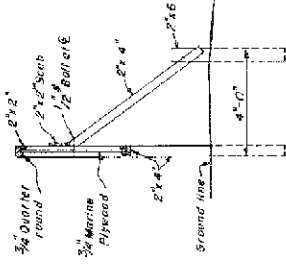
5' x 12' SIGN



CONSTRUCTION SIGNS



3' x 6' SIGN
AND
4' x 8' SIGN

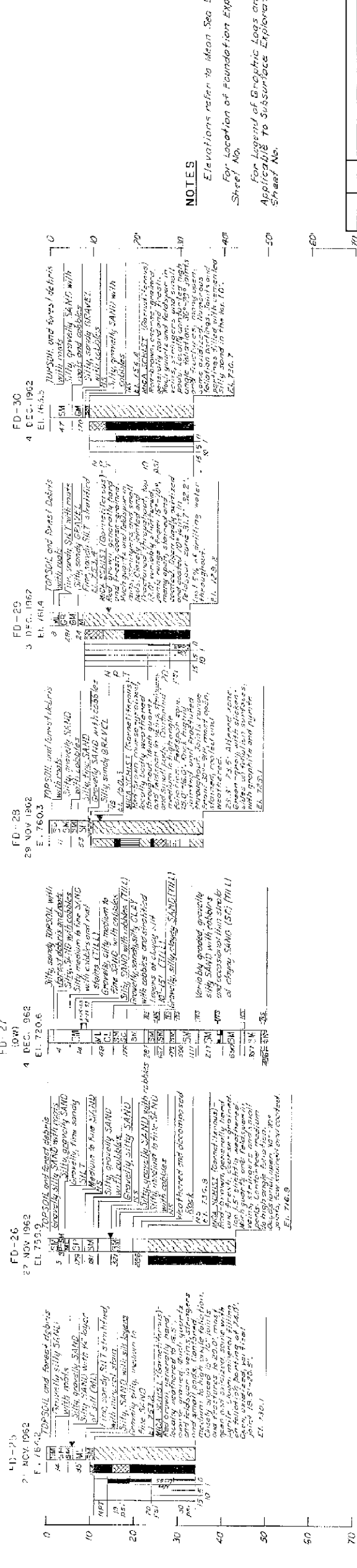
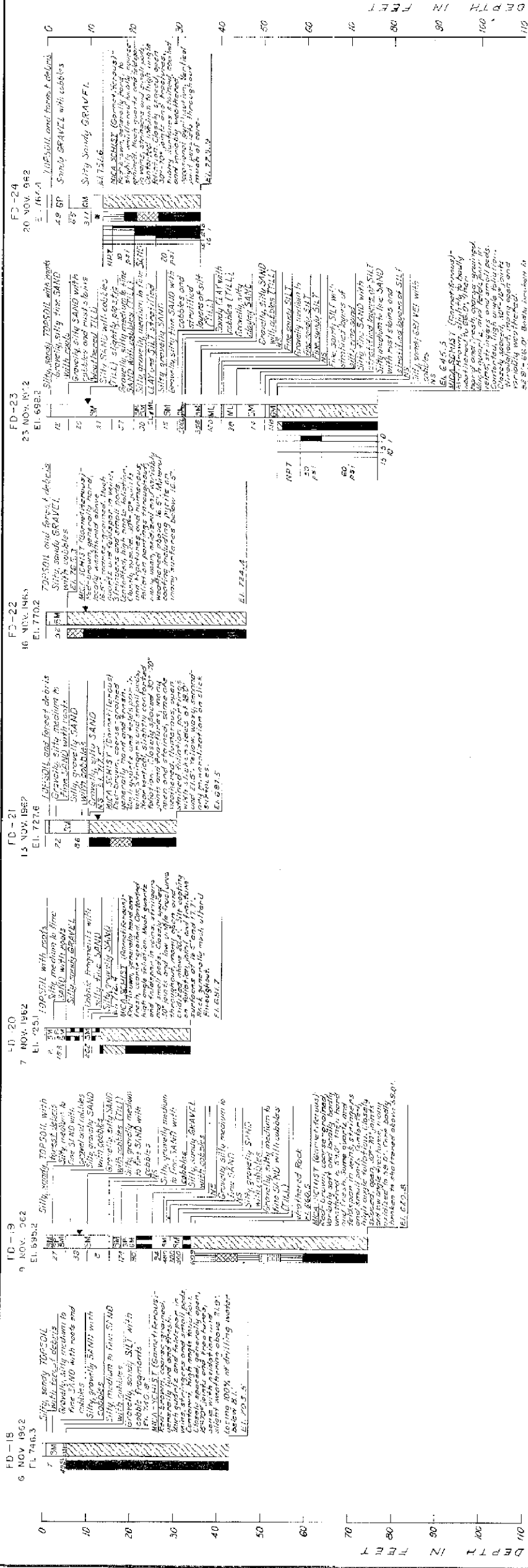


CONSTRUCTION SIGN

CON - 8

222

(VED) STANDARD FOR CIVIL WORKS - DAMS



NOTES

Elevations refer to Mean Sea Level Datum.

For Location of Foundation Explorations, see

Fe₂O₃·nH₂O

for Legend of Graphic Logs and Notes
applicable to Subsurface Explorations; see

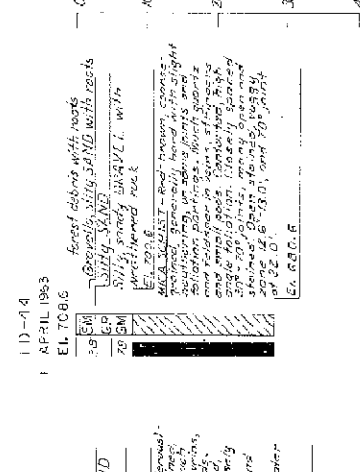
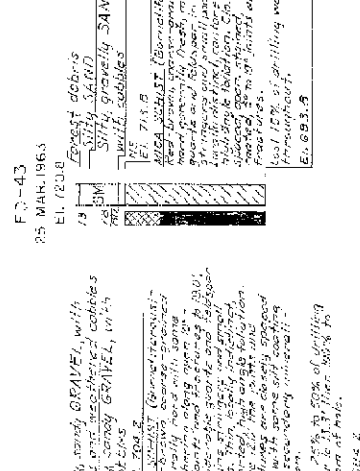
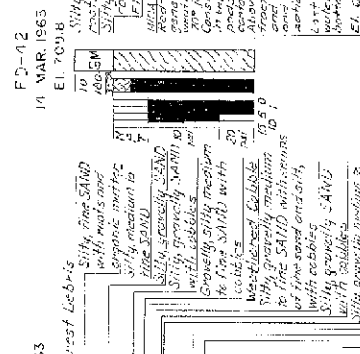
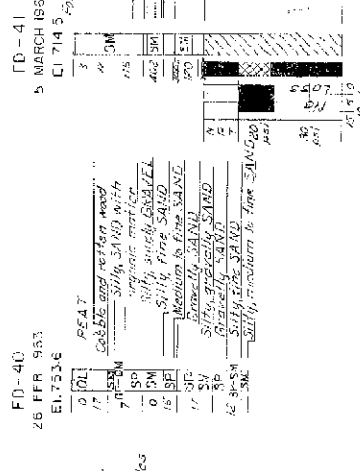
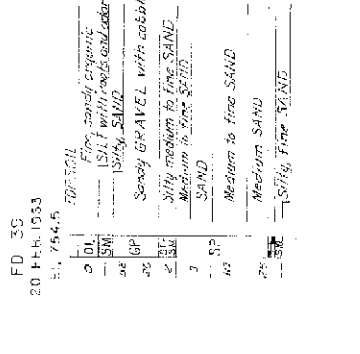
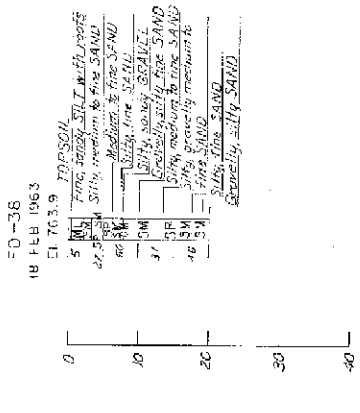
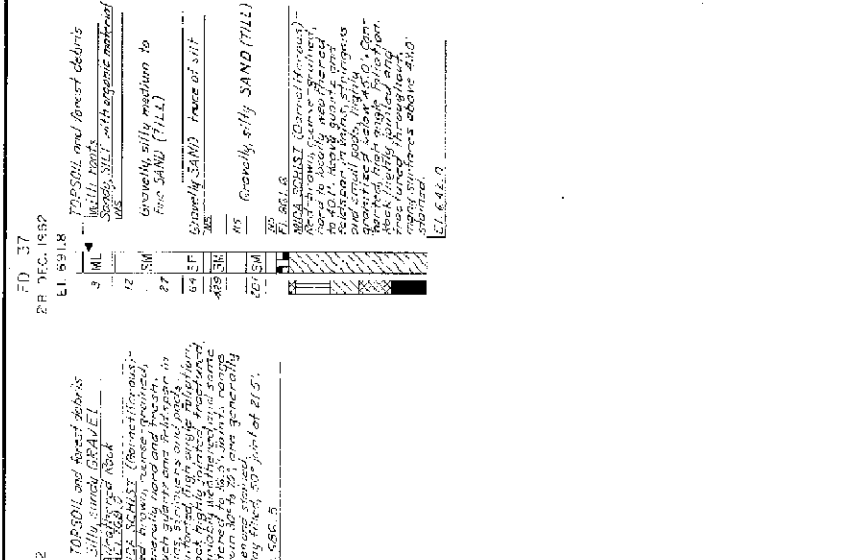
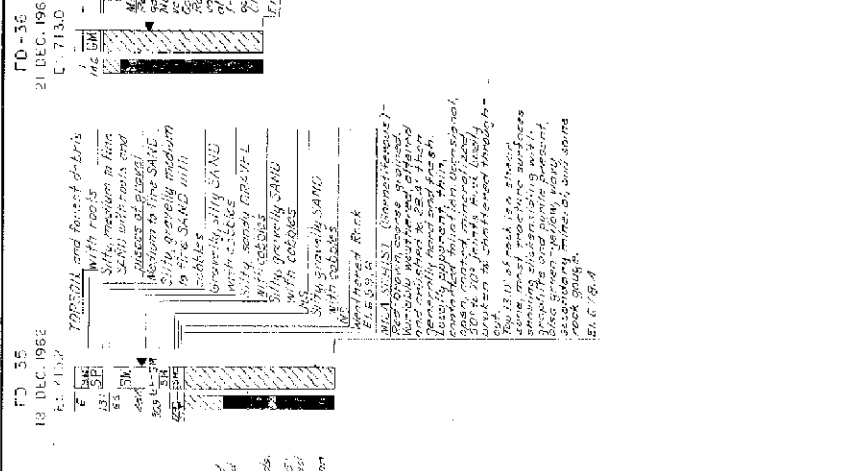
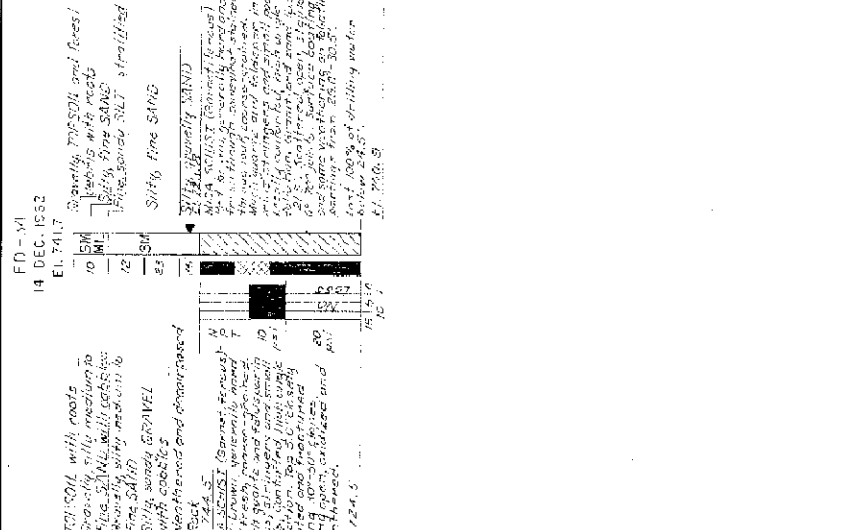
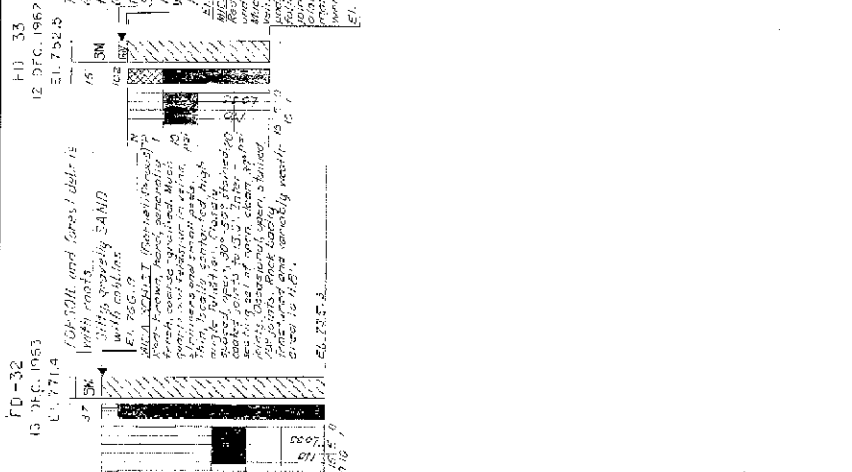
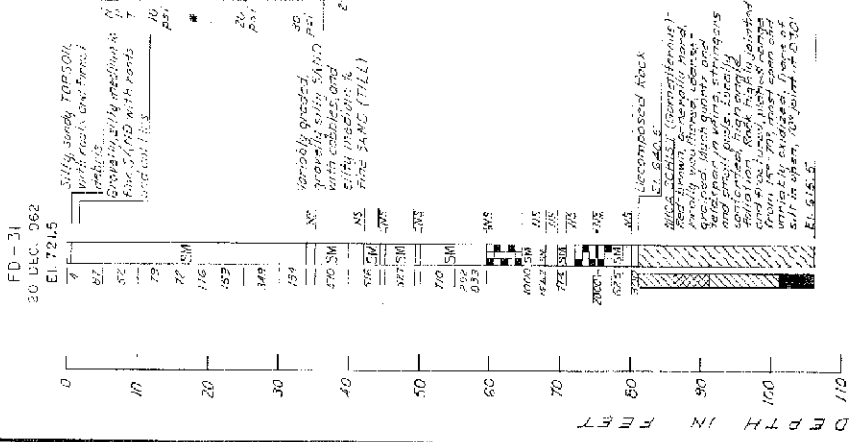
2227 No.

| | | | | | | |
|---|--------|--------|--------|------|---|----|
| DES. BY | DR. BY | CL. OF | CL. OF | DATE | REVISION | BY |
| | | | | | | |
| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS | | | | | | |
| CONNECTICUT RIVER FLOOD CONTROL CHICOPEE RIVER BASIN CONANT BROOK DAM RECORD OF FOUNDATION EXPLORATIONS CHICOPEE RIVER, MASSACHUSETTS | | | | | | |
| APPROVED <i>Ed W. Lusk</i> CHIEF ENGINEER DIVISION | | | | | DATE APRIL 1964 | |
| DESIGNED BY <i>Ed W. Lusk</i> CHIEF ENGINEER DIVISION | | | | | SCALE 1" = 10' DRAWING NUMBER CON - 8 | |
| CHECKED BY <i>Ed W. Lusk</i> CHIEF ENGINEER DIVISION | | | | | | |
| DESIGNED BY <i>Ed W. Lusk</i> CHIEF ENGINEER DIVISION | | | | | | |

GRAPHIC SCALE

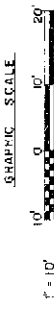
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DRAWING NUMBER
CON-8

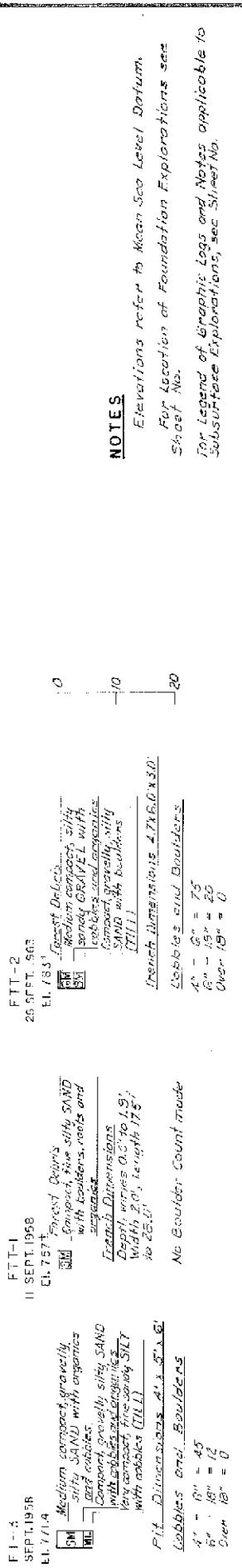
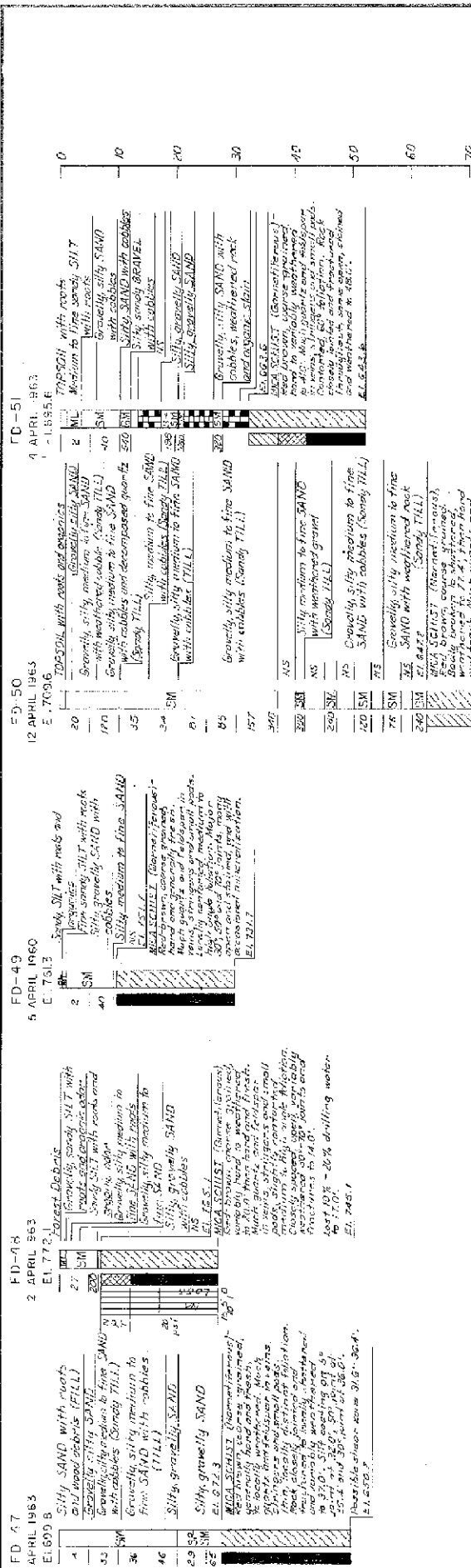
SHEET 22



NOTES

Elevations refer to Mean Sea Level Datum.
For location of Foundation Explorations FD-30, FD-39
and FD-40, see Sheet No. All others shown on Sheet No.
For Legend of Graphic Logs and Notes applicable
to Subsurface Explorations, see Sheet No.

[illegible]



WATER RESOURCES

Canary Islands, Spain, 1960
with photos and sketches.

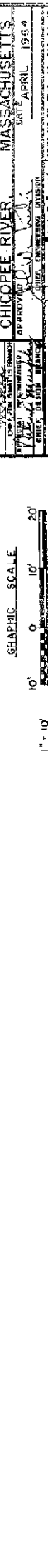
French Dimensions
of a road section.

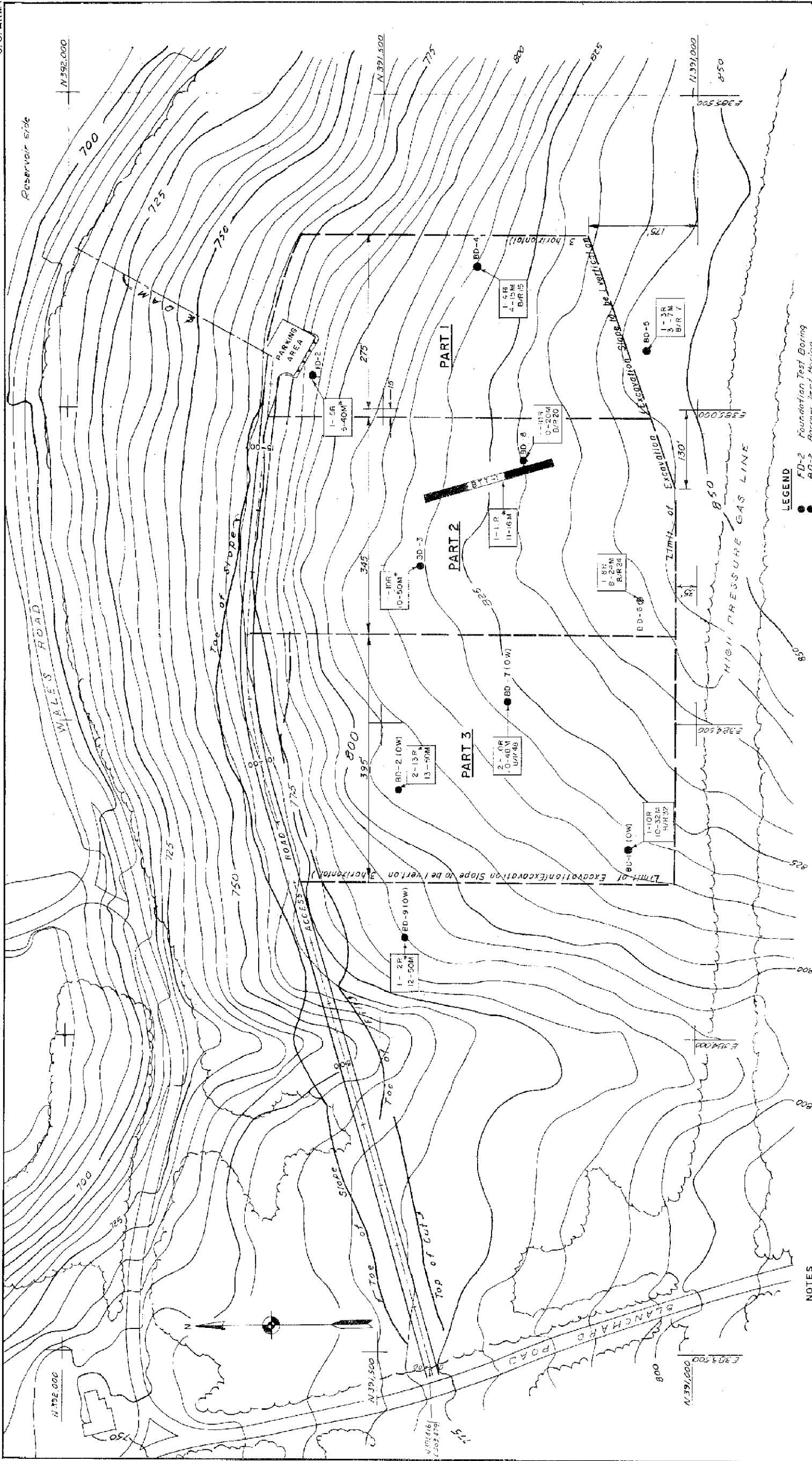
SAND with boulders.
SAND gravelsly, silty
loamst.

-10-

NOTES

| | | | |
|---|-----------------------|---|---|
| Pit Dimensions 4' x 5' x 10' with boulders (Till) Width 20", Length 17 1/2" to 25 1/2" | No Boulder Count made | French Dimensions 4' x 6' x 3' (Till) | 20 |
| Pit Dimensions 4' x 5' x 10' with boulders (Till) | No Boulder Count made | Lobbles and Boulders 4" - 6" = 75 6" - 15" = 20 Over 15" = | Elevations refer to Mean Sea Level Datum. For Location of Foundation Explorations see Sheet No. For Legend of Graphic Logs and Notes applicable to Subsurface Explorations, see Sheet No. |

[illegible]



NOTES

1. Figures in rectangles represent approximate death ranges for random fill unroofed (R); and imperforates fill unroofed (IAM) in explorations.
2. H/R Approximate death in handrock in feet
3. * indicates bedrock not encountered
4. For location of Barron Area, see Sheet
5. Elevations refer to Mean Sea Level, Datum
6. Contour interval is 5 feet
7. plane coordinates refer to Massachusetts' Lambert Grid System

PLAN
SCALE: 1" = 60'

GRAPHIC SCALE

[illegible]

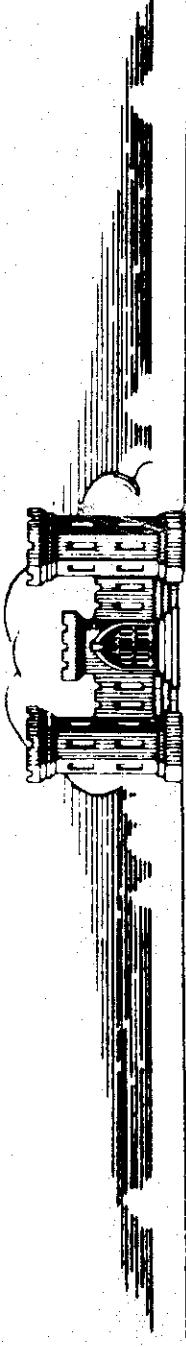
CONNECTICUT RIVER FLOOD CONTROL PROJECT
CONNANT BROOK DAM

CHICOPEE RIVER, MASSACHUSETTS

PLANS FOR THE

**CONSTRUCTION OF
HIGHWAY RELOCATION AND
APPURTENANT STRUCTURES**

VOLUME II

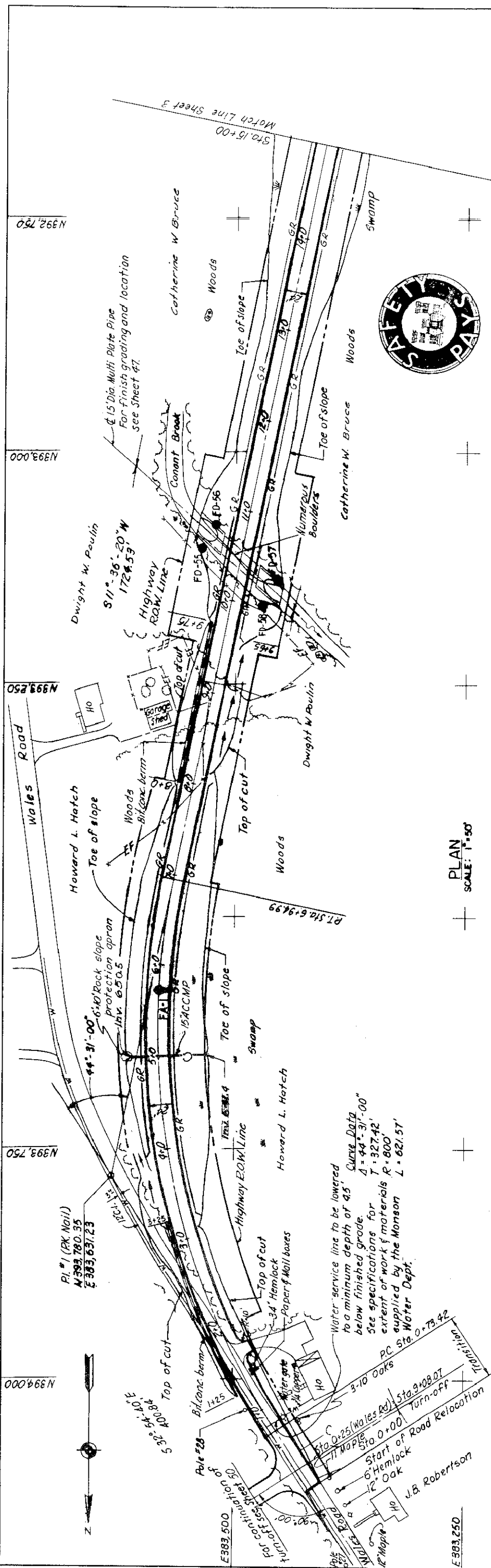


*Approved
5-13-64*

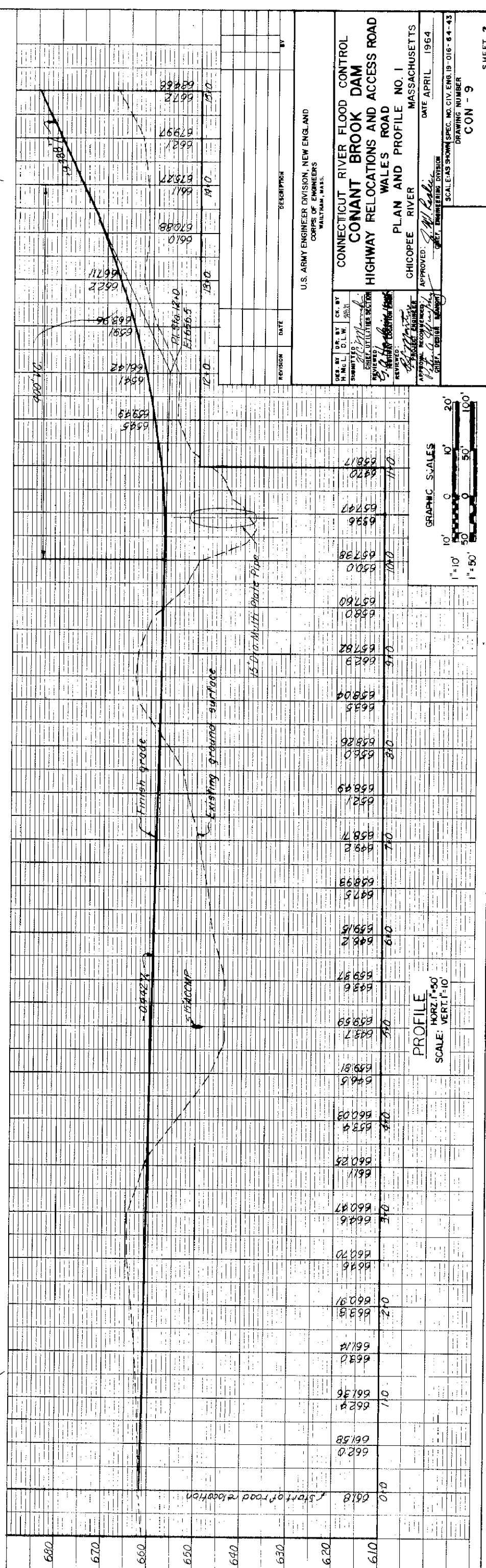
U.S. Army Engineer Division, New England
Corps of Engineers Waltham, Mass.

APRIL 1964

All drawings in this folio
have been reduced



PLAN
SCALE: 1"=50'

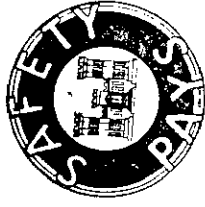
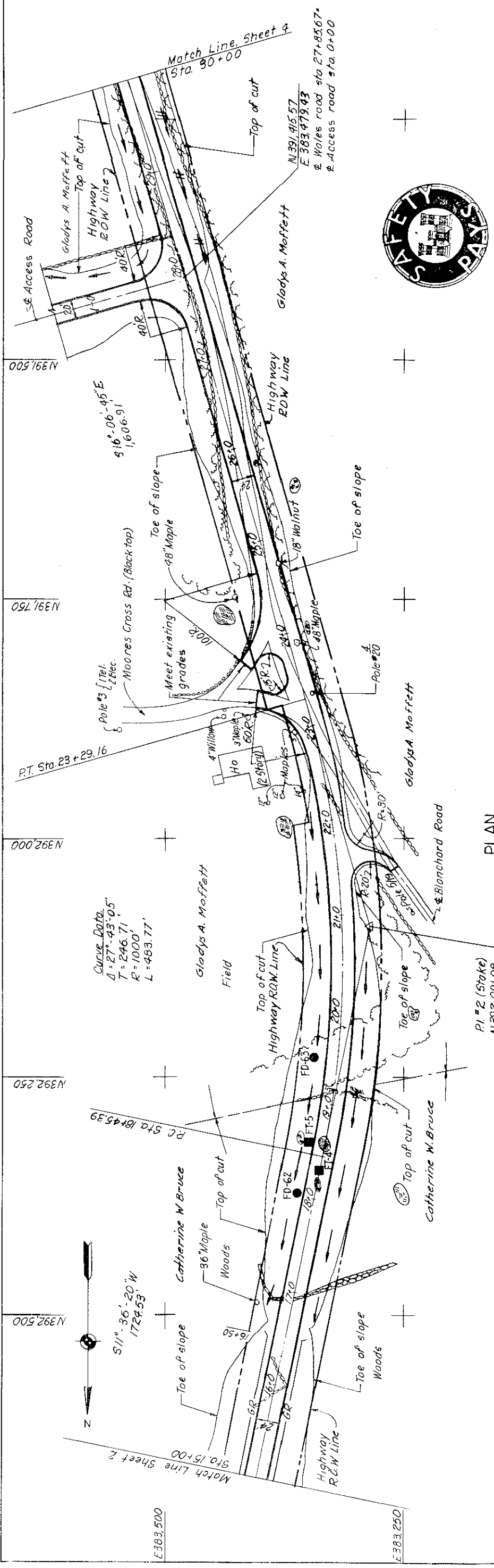


PROFILE
SCALE: VERT. 1"=10'
HORIZ. 1"=50'

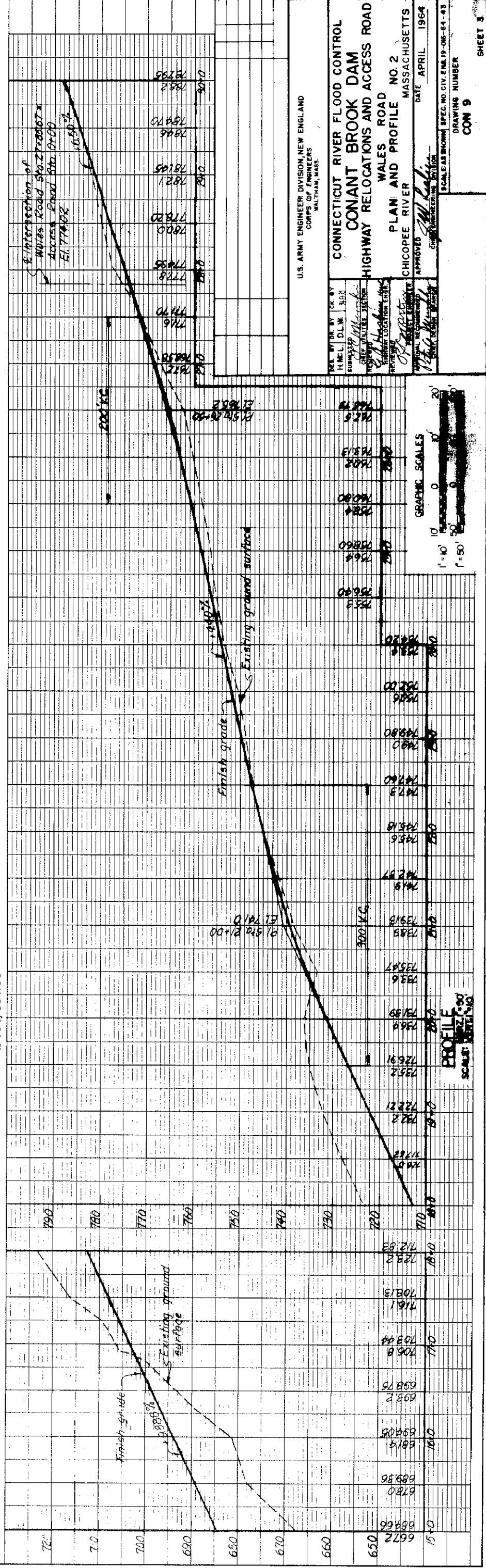
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| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | |
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD WALES ROAD PLAN AND PROFILE NO. 1 | |
| CHICOPEE RIVER MASSACHUSETTS | |
| APPROVED: <i>[Signature]</i> CHIEF, ENGINEERING DIVISION | DATE: APRIL 1964 |
| DRAWING NUMBER CON - 9 | |
| SHEET 2 | |

| | |
|-----|------|
| NO. | DATE |
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| 2 | 1964 |
| 3 | 1964 |
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| 99 | 1964 |
| 100 | 1964 |

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| 93 | 1964 |
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| 98 | 1964 |
| 99 | 1964 |
| 100 | 1964 |



PLAN
SCALE: 1"=50'



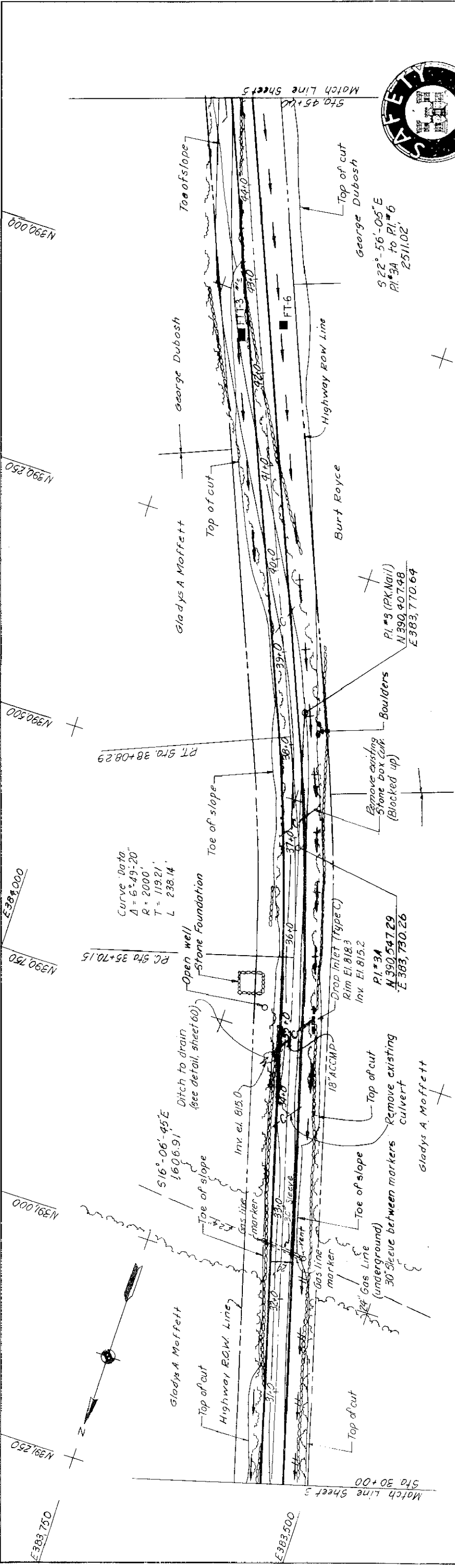
PROFILE
SCALE: 1"=20'

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
BOSTON, MASS.

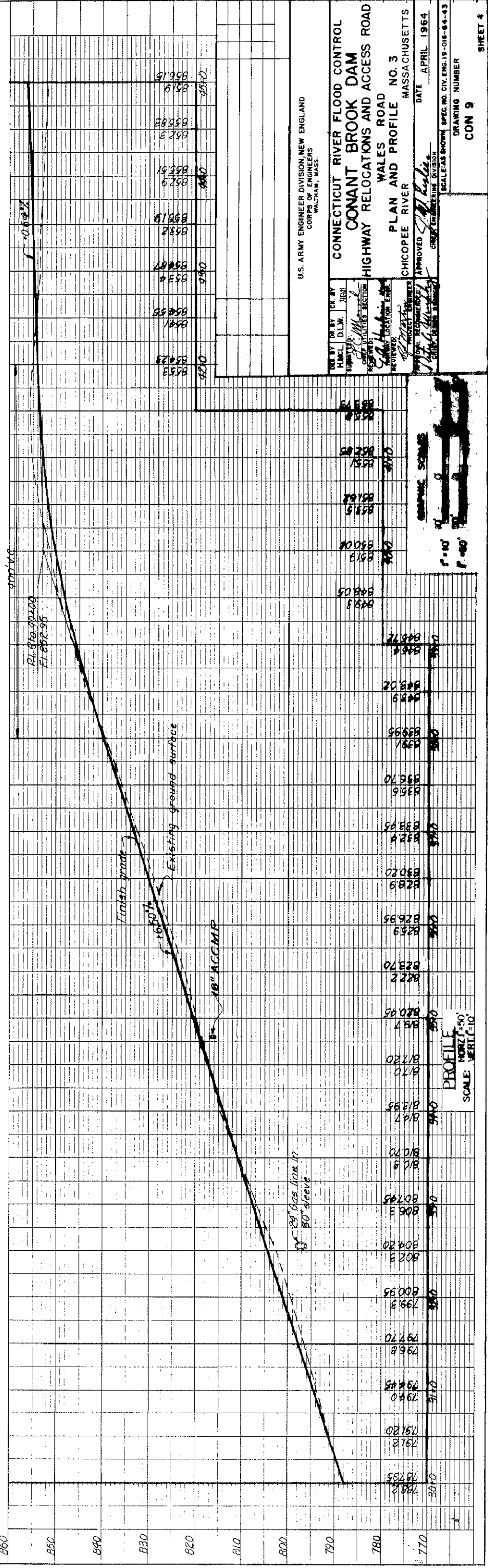
CONCAT BROOK DAM
HIGHWAY RELOCATIONS AND ACCESS ROAD
PLAN AND PROFILE NO. 2
WALES ROAD
CHICOPEE RIVER
MASSACHUSETTS

APPROVED: [Signature]
DATE: APRIL 1964

SCALE AS SHOWN SPEC. NO. CIV. ENR. 19-OR-64-43
DRAWING NUMBER
CON 9
SHEET 3



PLAN
SCALE: 1"=50'



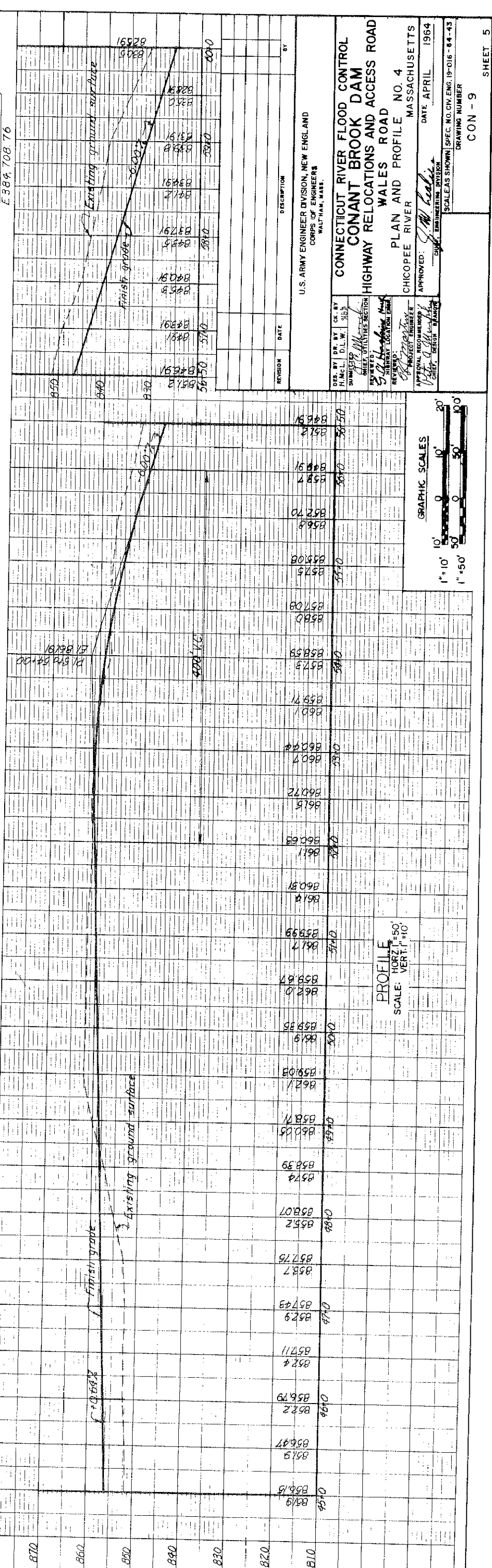
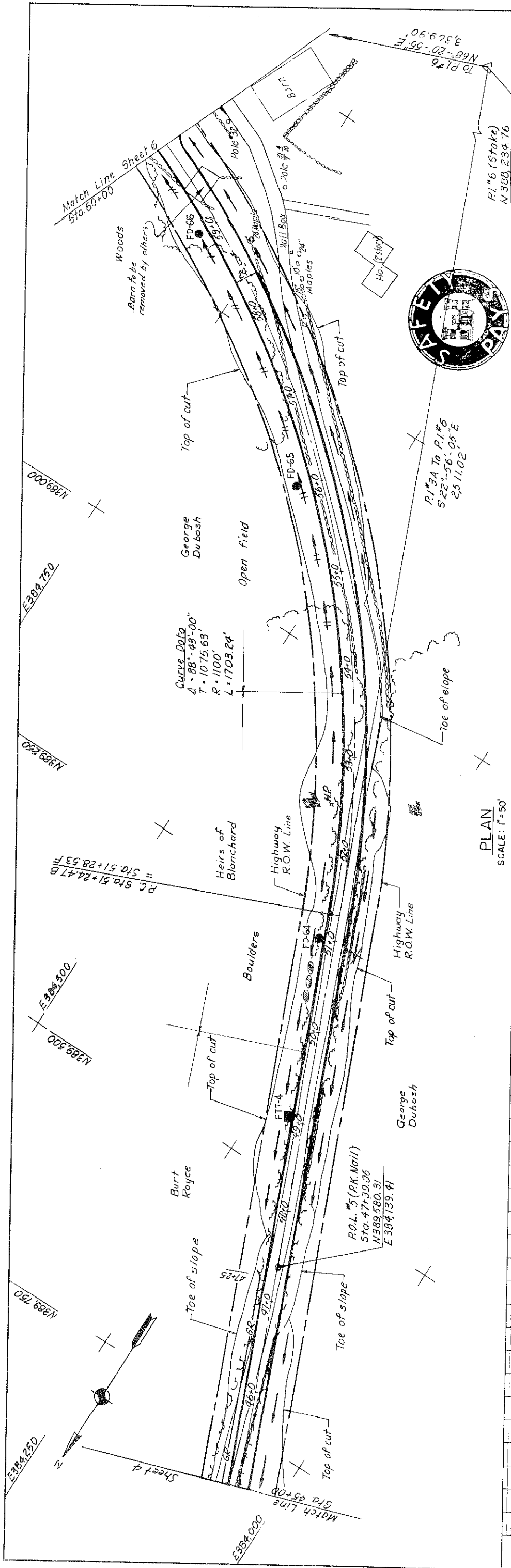
U.S. ARMY ENGINEER DIVISION NEW ENGLAND
CORPS OF ENGINEERS
WALTON, MASS.

CONNECTICUT RIVER FLOOD CONTROL
CONANT BROOK DAM
HIGHWAY RELOCATIONS AND ACCESS ROAD

PLAN AND PROFILE NO. 3
WALES ROAD
CHICOPEE RIVER
MASSACHUSETTS

APPROVED: [Signature]
DATE: APRIL 1964

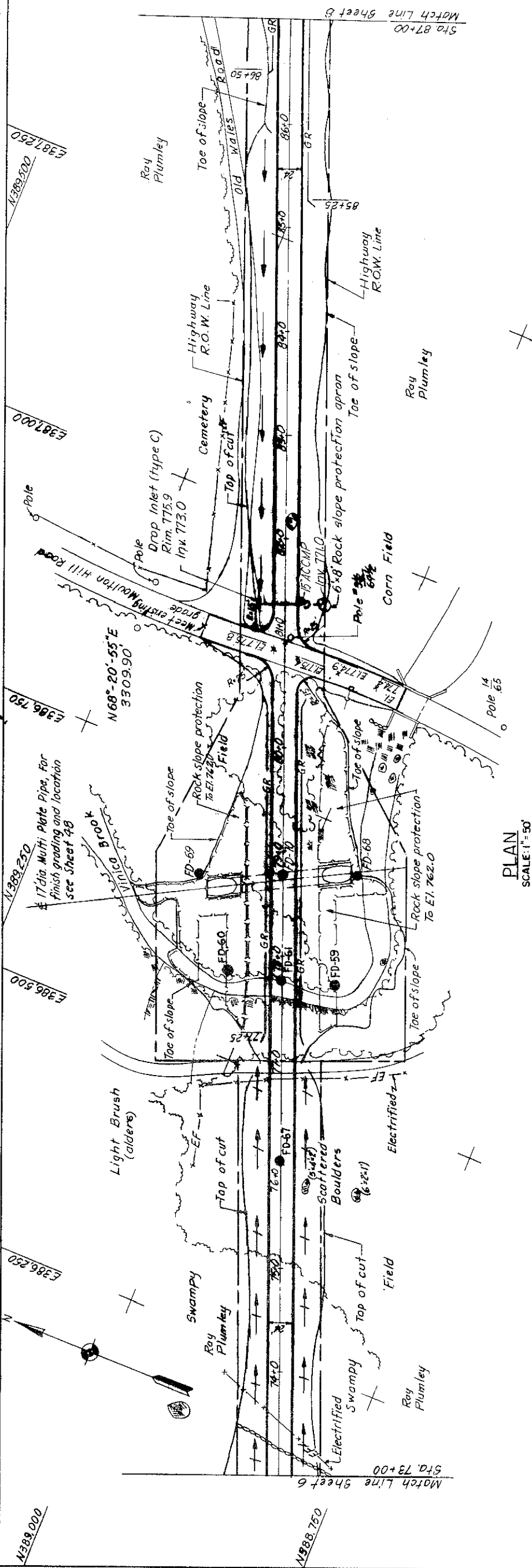
SCALE: AS SHOWN SPEC. NO. CIV. ENG. 19-018-84-43
DRAWING NUMBER
CON 9
SHEET 4



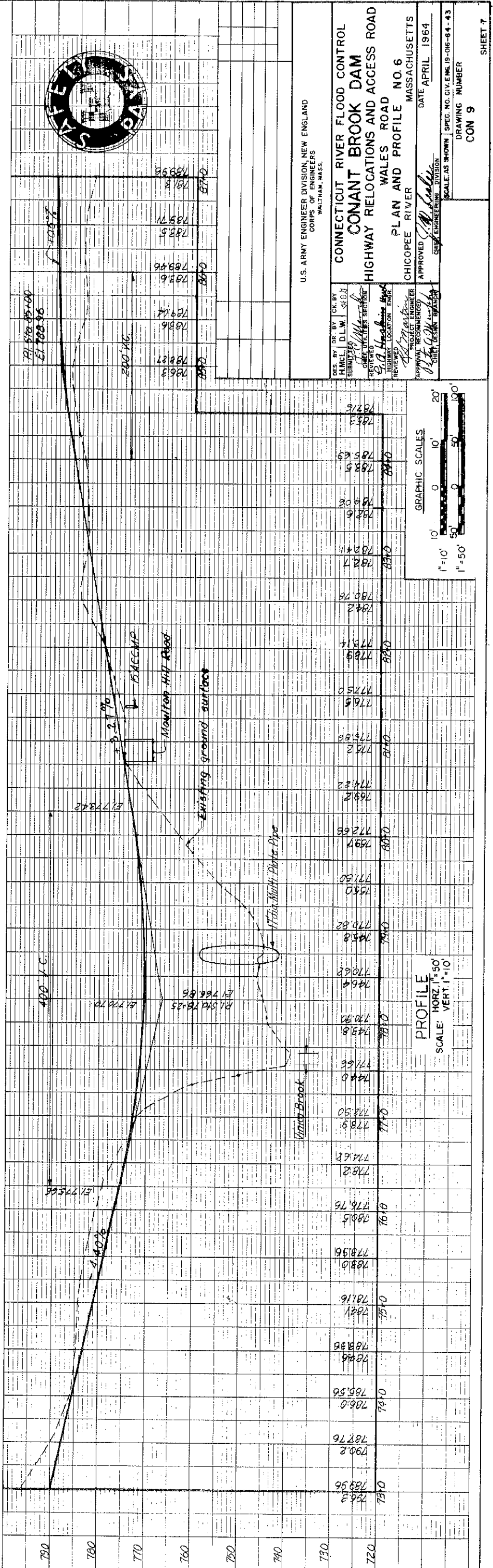
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| 1 | AS SHOWN |

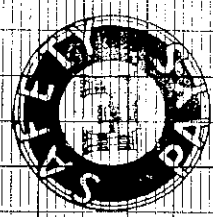
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| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | |
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD | |
| PLAN AND PROFILE NO. 4 CHICOPPEE RIVER MASSACHUSETTS | |
| DES. BY: DR. BY: CK. BY: H.M.C.L. D.L.W. J.B.S. | DATE: APRIL 1964 |
| APPROVED: J.M. Ladd | |
| CHIEF ENGINEER DIVISION | |
| SCALE AS SHOWN SPEC. NO. CIV. ENG. 19-016 - 64-43 | |
| DRAWING NUMBER | |
| CON - 9 | |
| SHEET 5 | |



PLAN
SCALE: 1"=50'



PROFILE
SCALE: 1"=50'

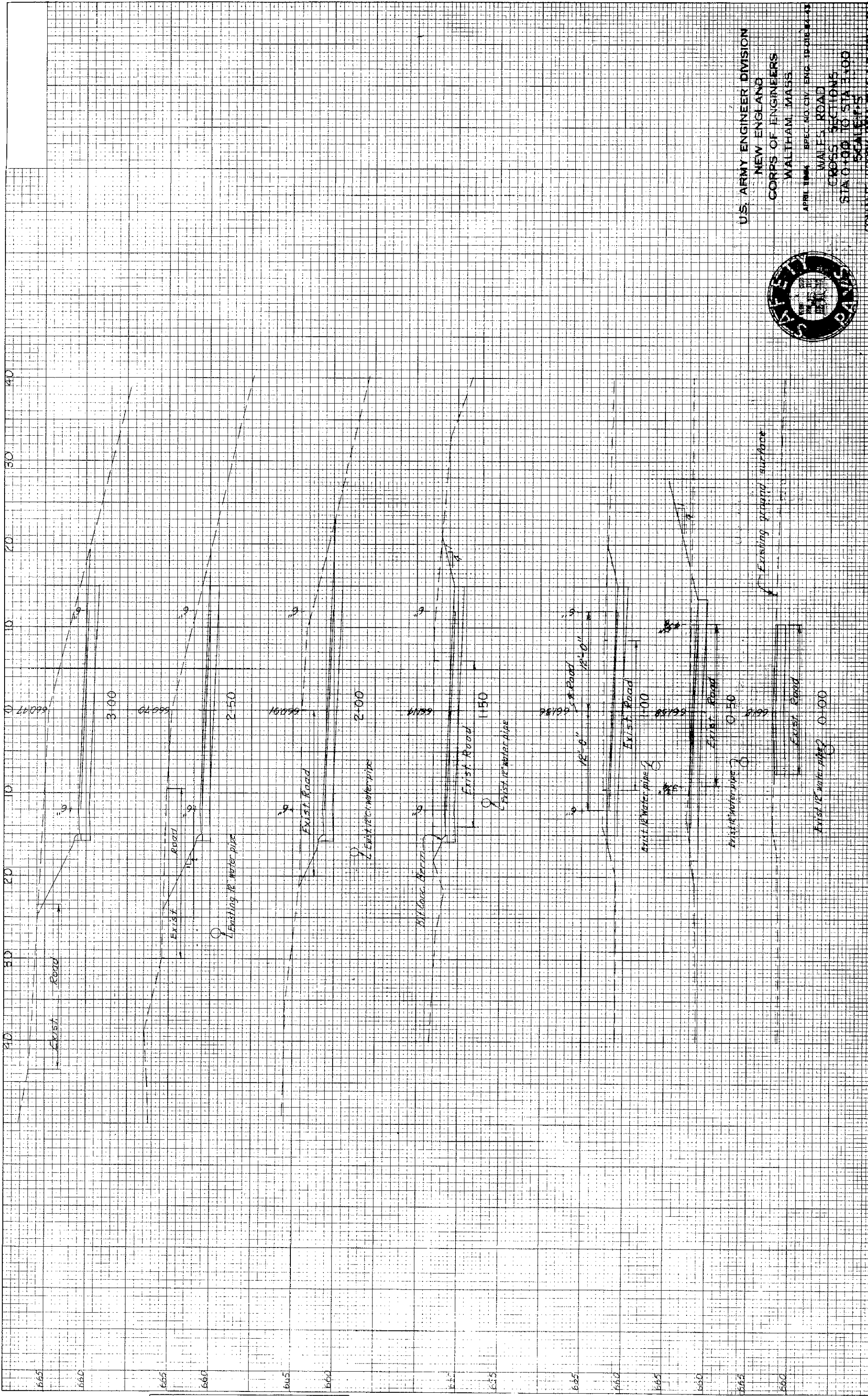


U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

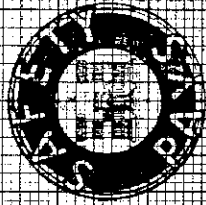
DES. BY: [] CK. BY: []
H.M.C.L. D.L.W. []
SUBMITTED: []
REVIEWED: []
REVIEWED: []
REVIEWED: []
REVIEWED: []

CONCAT BROOK DAM
HIGHWAY RELOCATIONS AND ACCESS ROAD
PLAN AND PROFILE NO. 6
CHICOPEE RIVER
MASSACHUSETTS
APPROVED: []
DATE: APRIL 1964

SCALE: AS SHOWN
SPEC. NO. CIV. ENG. 19-016-84-43
DRAWING NUMBER
CON 9
SHEET 7

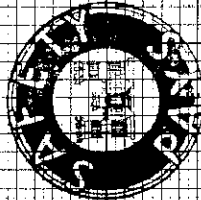
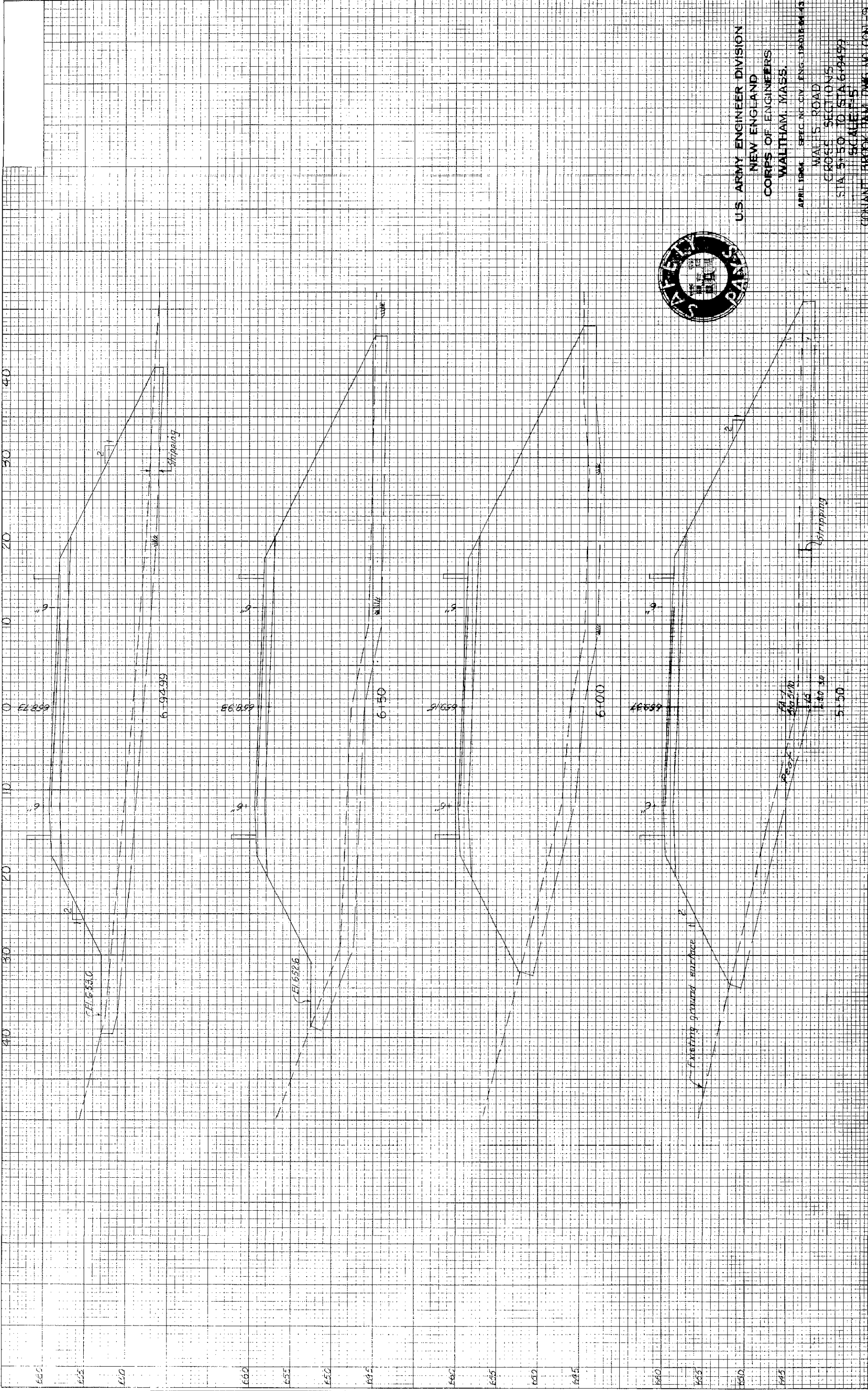


U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.



APRIL 1944. SPEC. NO. CIV. ENG. 10-0186-4-43
WALTON ROAD
CROSS SECTIONS
STA 0+00 TO STA 1+00
SCALE: 1" = 20'

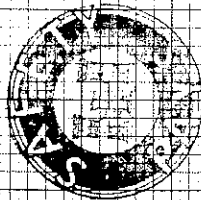
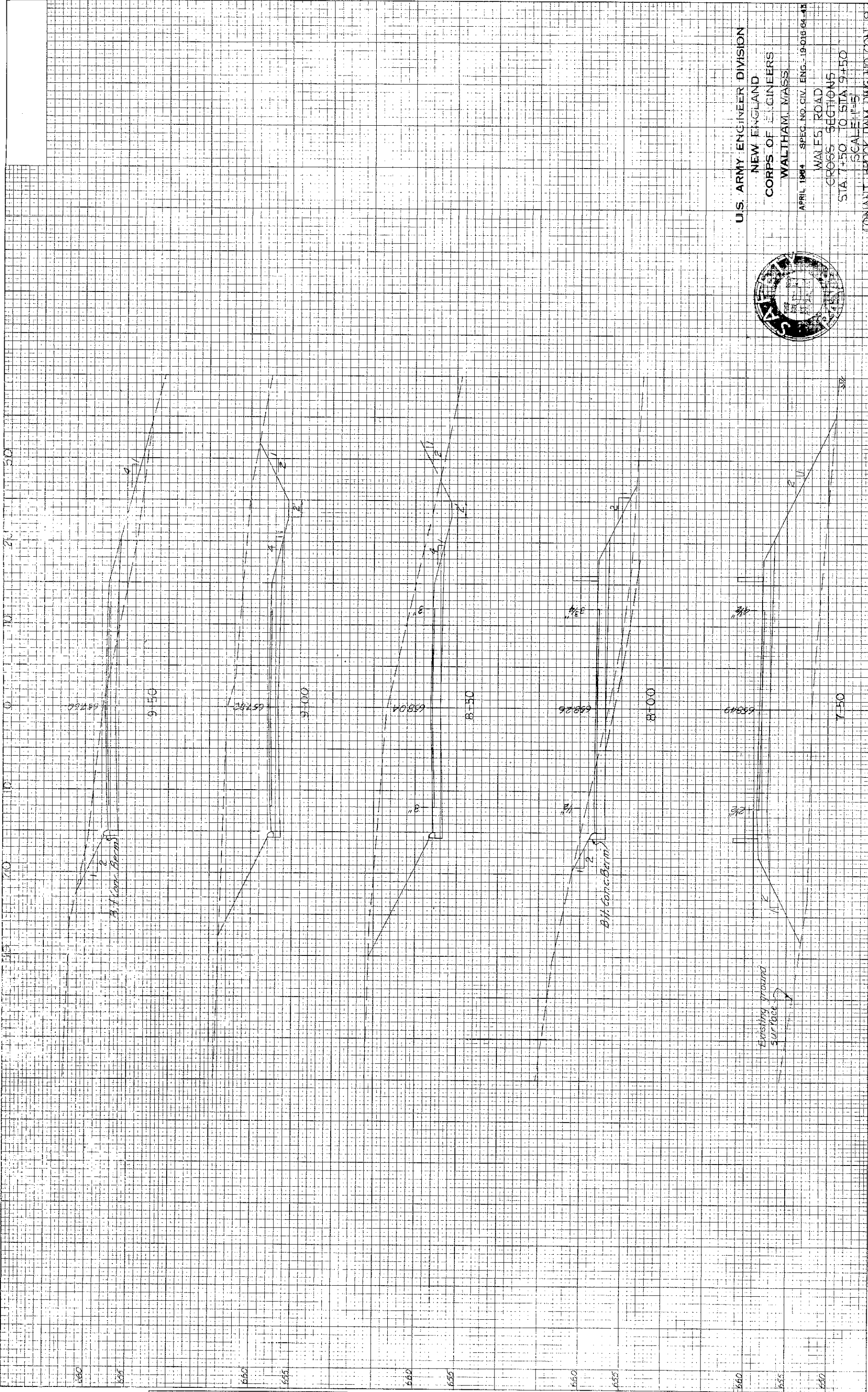
CONTINUED FROM PREVIOUS SHEET



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. 19-012-04-43
WALL ROAD
CROSS SECTIONS
STA. 5+50 TO STA. 6+00
SCALE 1"=5'
CONTANT THROUGH DAM DWG. NO. 100-10-19

| | |
|---------------|------|
| NO. | DATE |
| FINAL SURVEY | |
| NOTE BOOK | |
| REMARKS | |
| PLOTTER | |
| CHECKED | |
| AREAS CHECKED | |

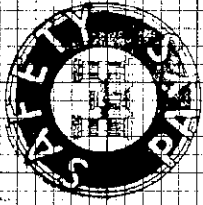
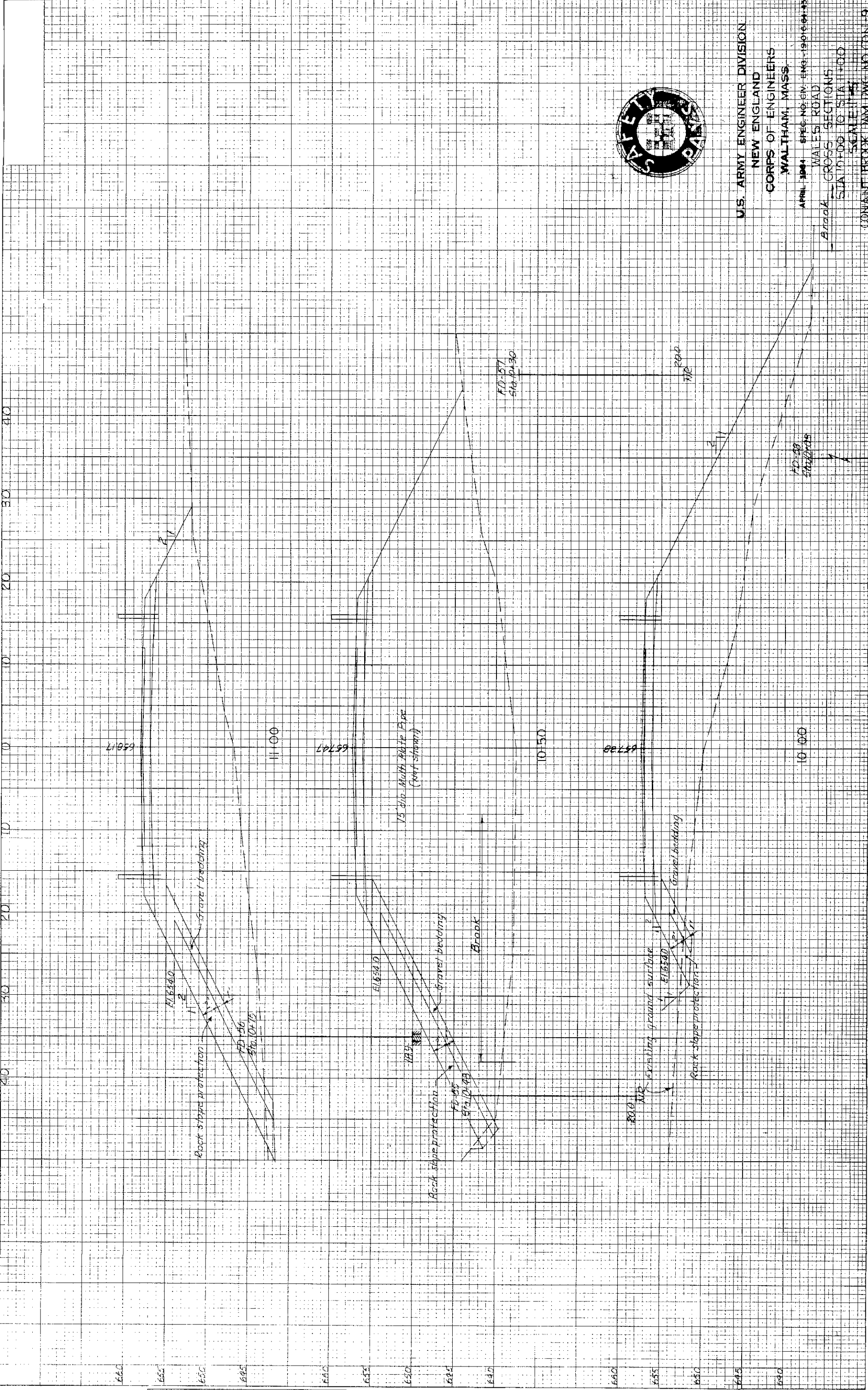
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|-----------------|------|
| NO. | DATE |
| ORIGINAL SURVEY | |
| NOTE BOOK | |
| REMARKS | |
| PLOTTER | |
| CHECKED | |
| AREAS CHECKED | |



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. - 19-016-04-43
WALF51 ROAD
CROSS SECTIONS
STA 7+50 TO STA 9+50
SCALE 1"=5'
CONANT BROOK DAM DWG. NO. CON-19

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|---------------|---------------|
| NO. | FINAL |
| DATE | DATE |
| BY | BY |
| SUBMITTED | SUBMITTED |
| REPLATE | REPLATE |
| NOTE BOOK | NOTE BOOK |
| AREAS CHECKED | AREAS CHECKED |

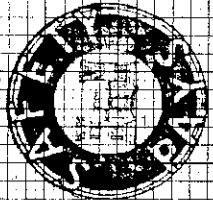
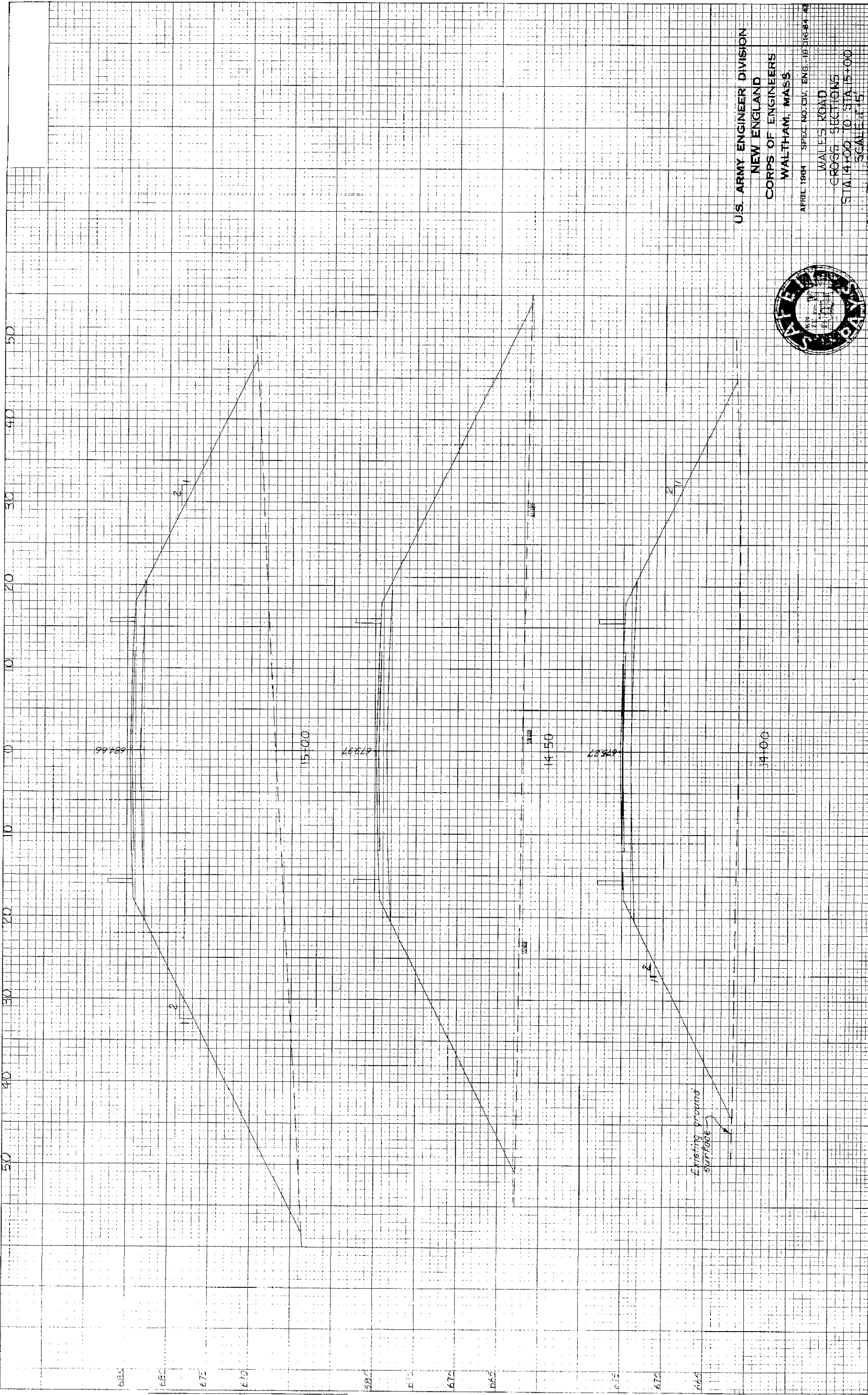
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| NO. | ORIGINAL |
| DATE | DATE |
| BY | BY |
| SUBMITTED | SUBMITTED |
| REPLATE | REPLATE |
| NOTE BOOK | NOTE BOOK |
| AREAS CHECKED | AREAS CHECKED |



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

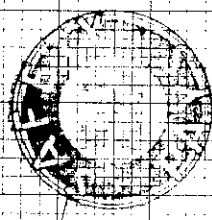
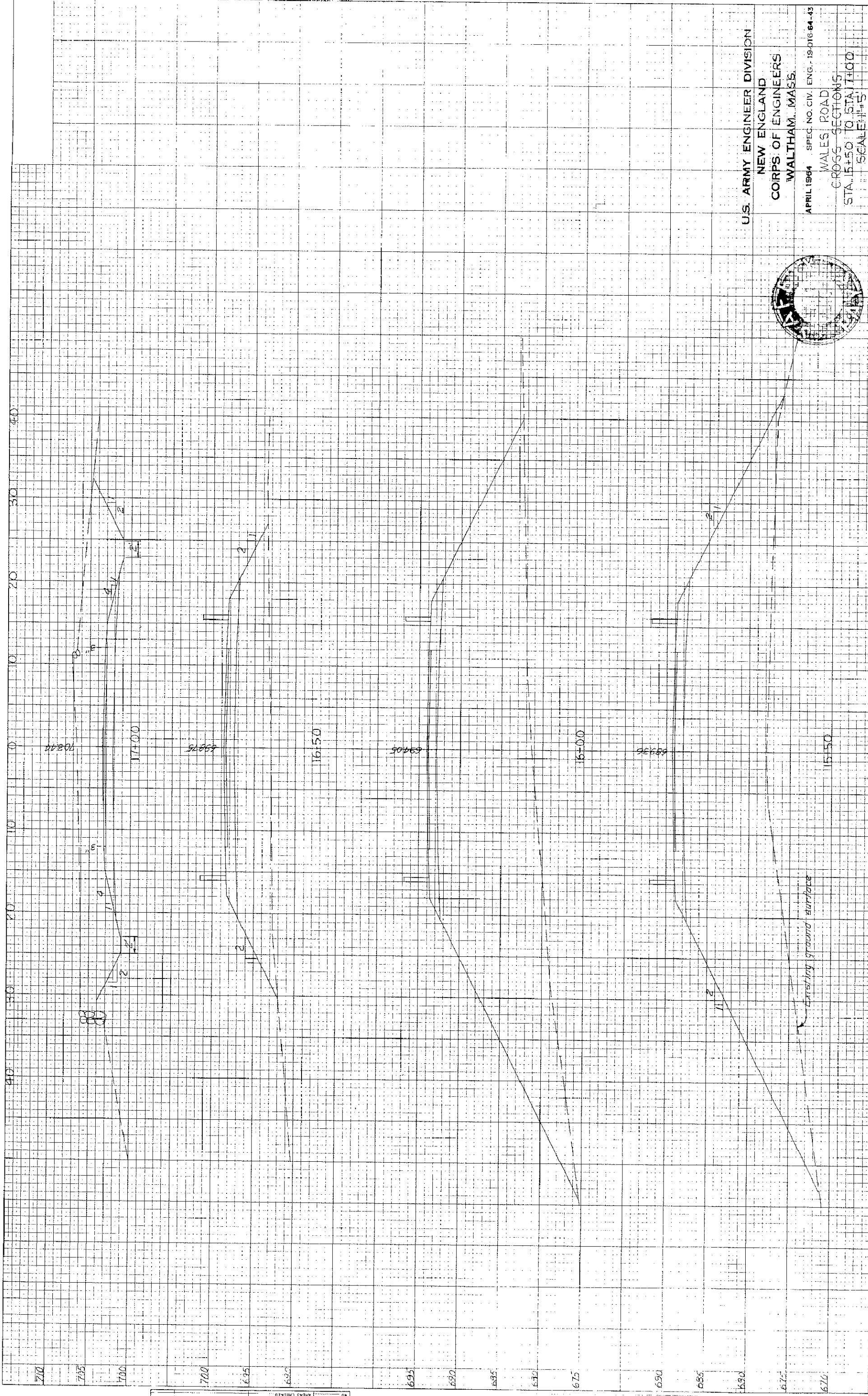
APRIL 1941 SPEC. NO. 611, ENG. 190-664-15
Brook WALES ROAD
CROSS SECTIONS
STA 10+00 TO STA 11+00
SCALE 1" = 20'

CONANT BROOK DAM DWG. NO. 201-9



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC NO. CIV. ENG. 18-016-84-48
WALLES ROAD
CROSS SECTIONS
STA 14+00 TO STA 15+00
SCALE: 1" = 15'
CONANT BROOK DAM DWG NO. 1001-9



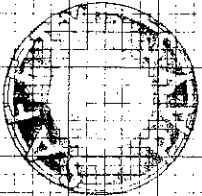
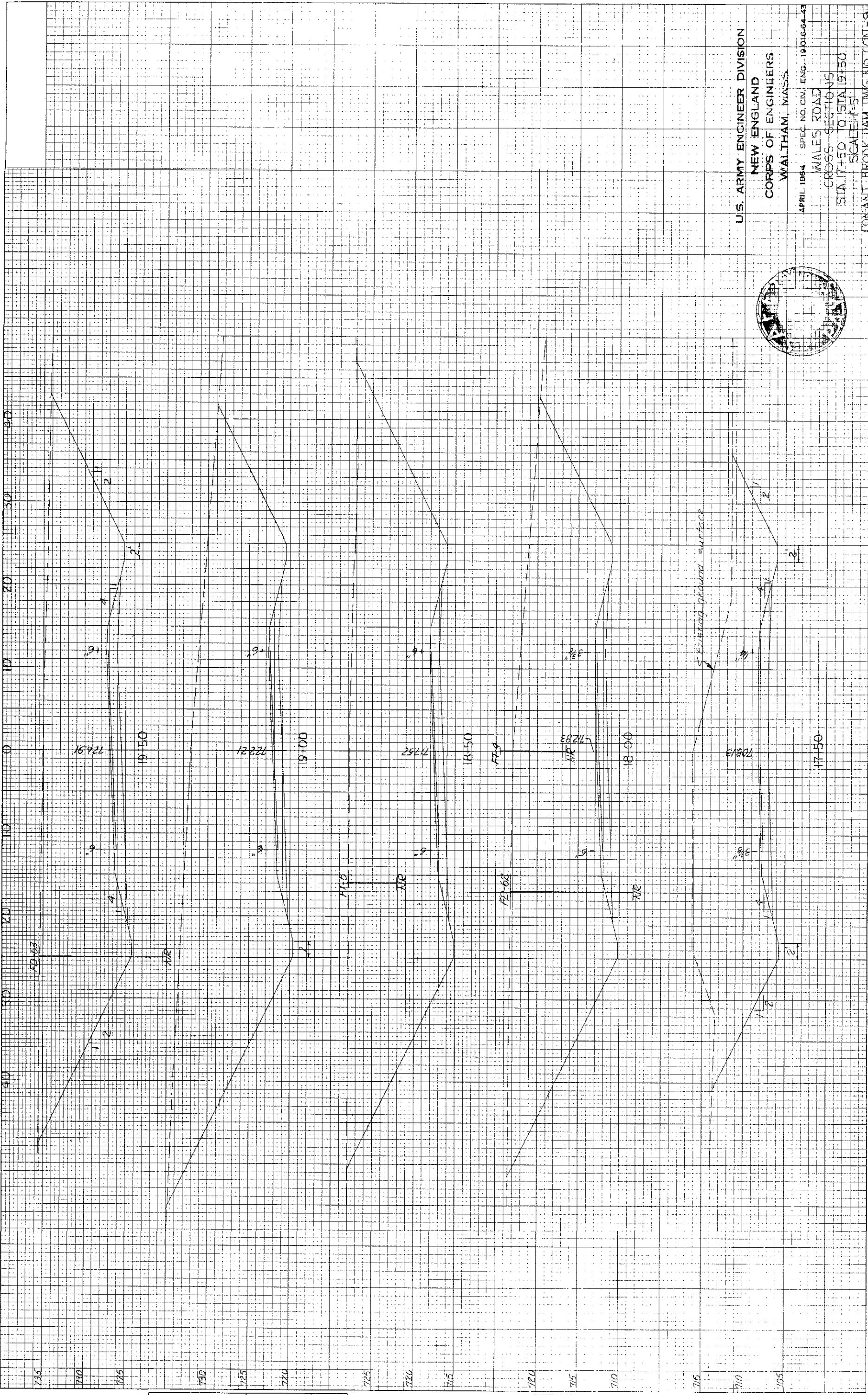
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC. NO. CIV. ENG. 19-016 64-43
WALES ROAD
CROSS-SECTION 5
STA. 15+50 TO STA. 17+00
SCALE 1"=5'

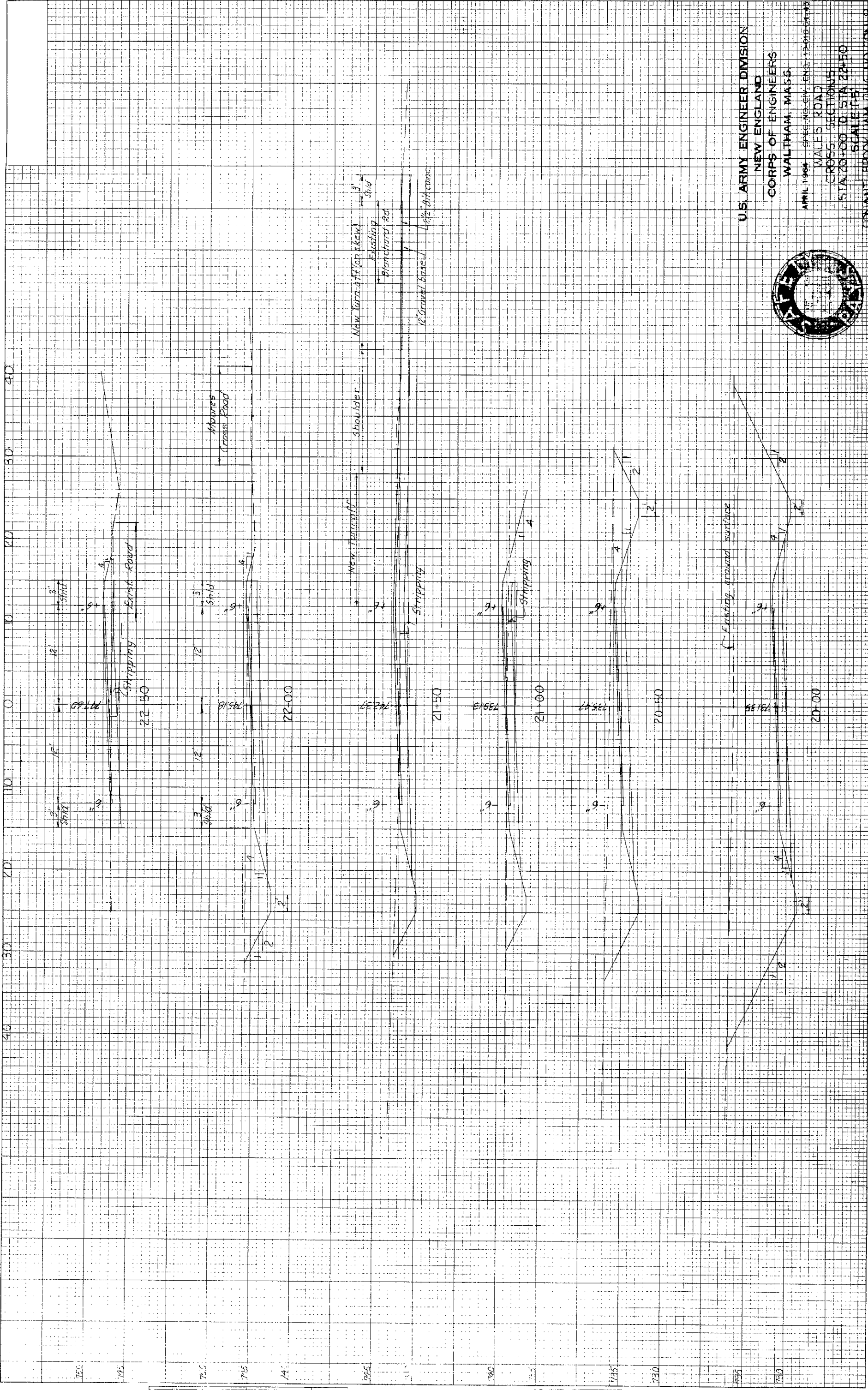
CONANT BROOK DAM DWG NO. CON-19
SHEET 16

| | |
|--------------|------|
| FINAL SURVEY | |
| NO. | DATE |
| SUBMITTED | |
| CHECKED | |
| DESIGNED | |
| DRAWN | |
| BY | |
| DATE | |

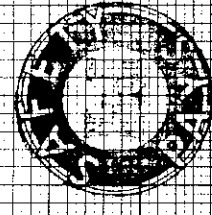
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| ORIGINAL SURVEY | |
| NO. | DATE |
| SUBMITTED | |
| CHECKED | |
| DESIGNED | |
| DRAWN | |
| BY | |
| DATE | |



U.S. ARMY ENGINEER DIVISION
 NEW ENGLAND
 CORPS OF ENGINEERS
 WALTHAM, MASS.
 APRIL 1964 SPEC. NO. CIV. ENG.-19016-64-43
 WALES ROAD
 CROSS SECTIONS
 STA. 17+50 TO STA. 39+50
 SCALE: 1"=5'
 CONANT BROOK DAM DWG. NO. CON-191



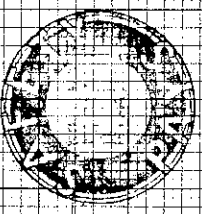
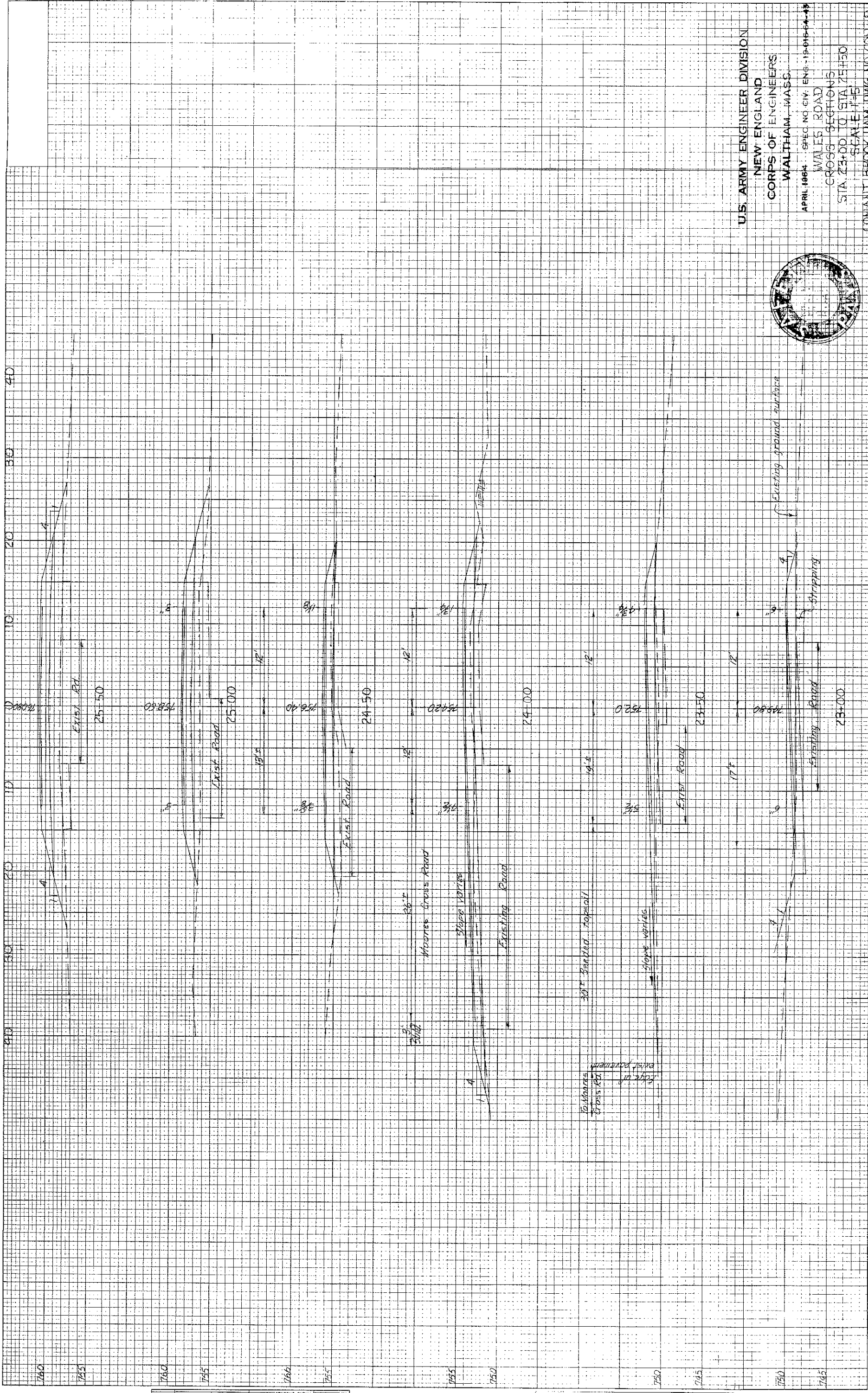
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.



APRIL 1964 SPEC. NO. CIV. ENG. 13-015-A-15
WALTON ROAD
CROSS SECTIONS
STA 20+00 TO STA 22+50
SCALE 1"=15'
CONSTANT BROOK DAM DUG NO. 100-1-2

| | |
|--------------|------|
| FINAL | DATE |
| SURVEY | BY |
| NO. 100-1-2 | DATE |
| AREA CHECKED | DATE |

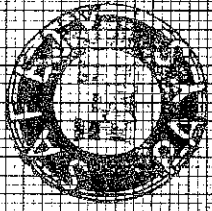
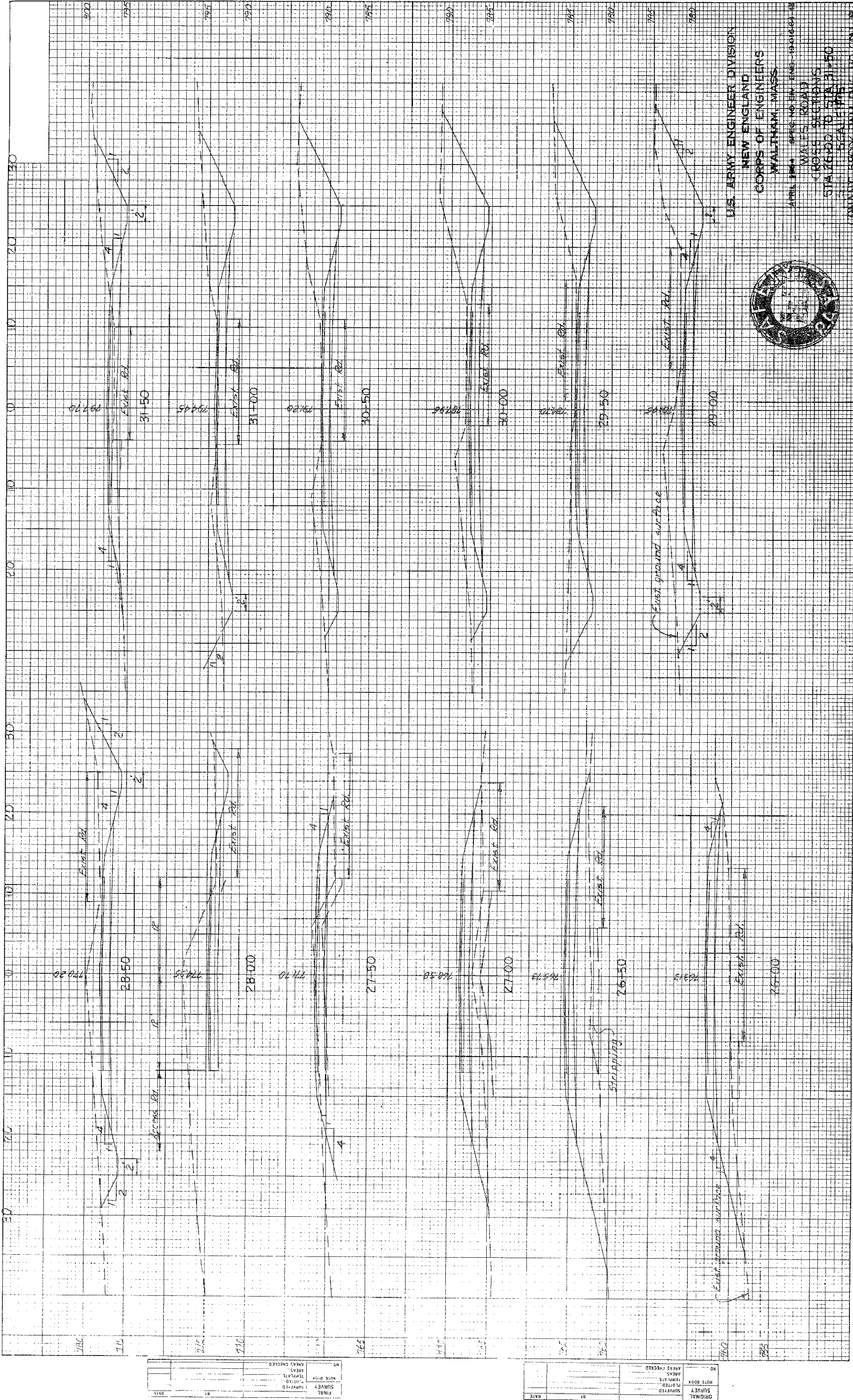
| | |
|--------------|------|
| ORIGINAL | DATE |
| SURVEY | BY |
| NO. 100-1-2 | DATE |
| AREA CHECKED | DATE |



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC NO. CIV. ENG. 19-015-64-15
WALFIS ROAD
CROSS SECTIONS
STA. 23+00 TO STA. 25+50
SCALE: 1"=5'
CONANT BROOK DAM DWG NO. 100119

| | |
|---------------|------|
| NO. | DATE |
| BY | |
| DATE | |
| FINAL | |
| SURVEY | |
| PLOTTED | |
| TEMPERATURE | |
| AREAS CHECKED | |
| NOTES BOOK | |
| DATE | |

| | |
|---------------|------|
| NO. | DATE |
| BY | |
| DATE | |
| ORIGINAL | |
| SURVEY | |
| PLOTTED | |
| TEMPERATURE | |
| AREAS CHECKED | |
| NOTES BOOK | |
| DATE | |



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

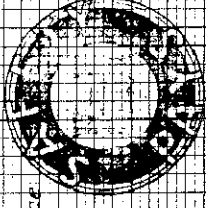
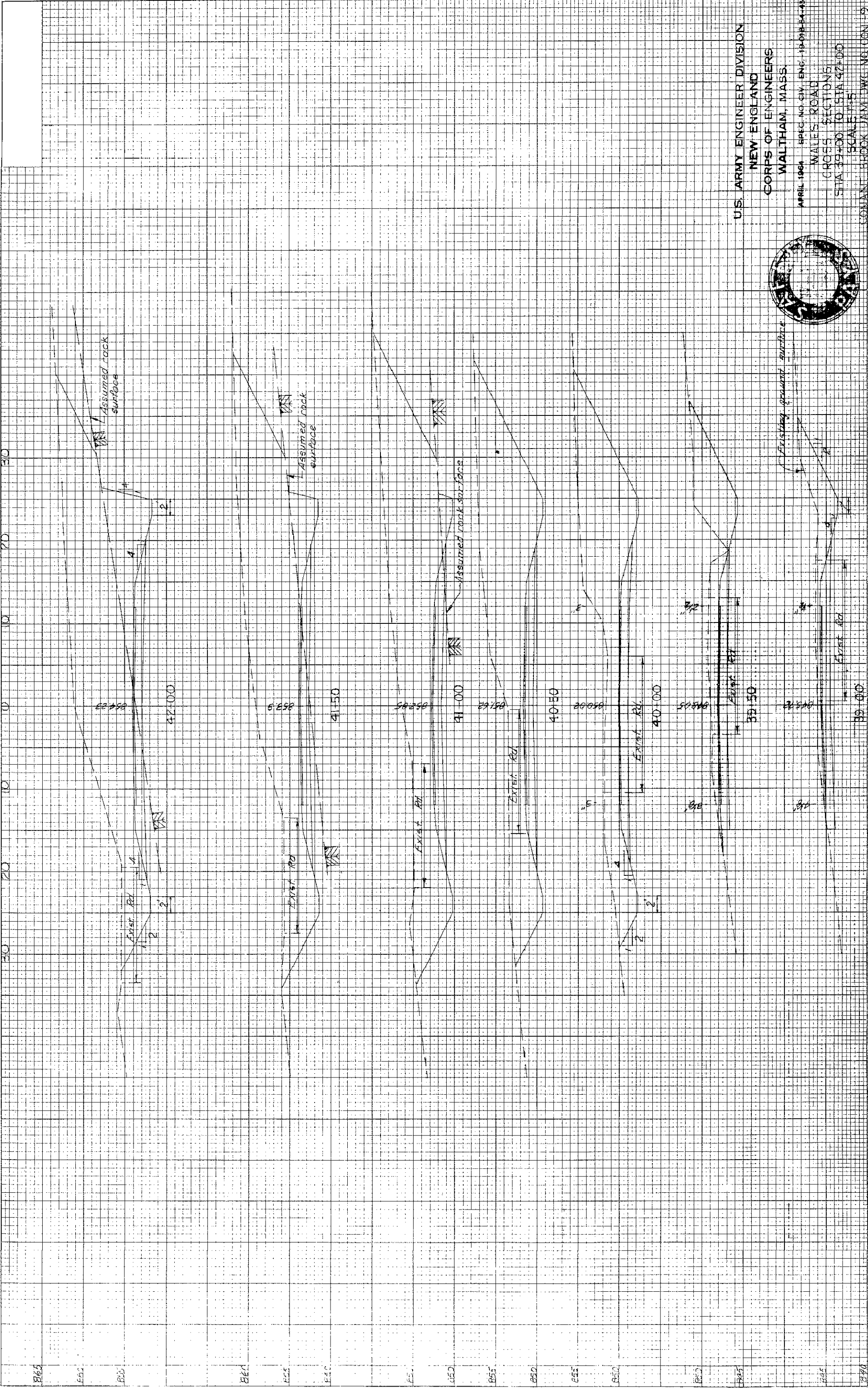
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WALTHAM ROAD

CROSS SECTIONS

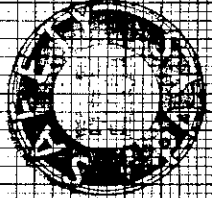
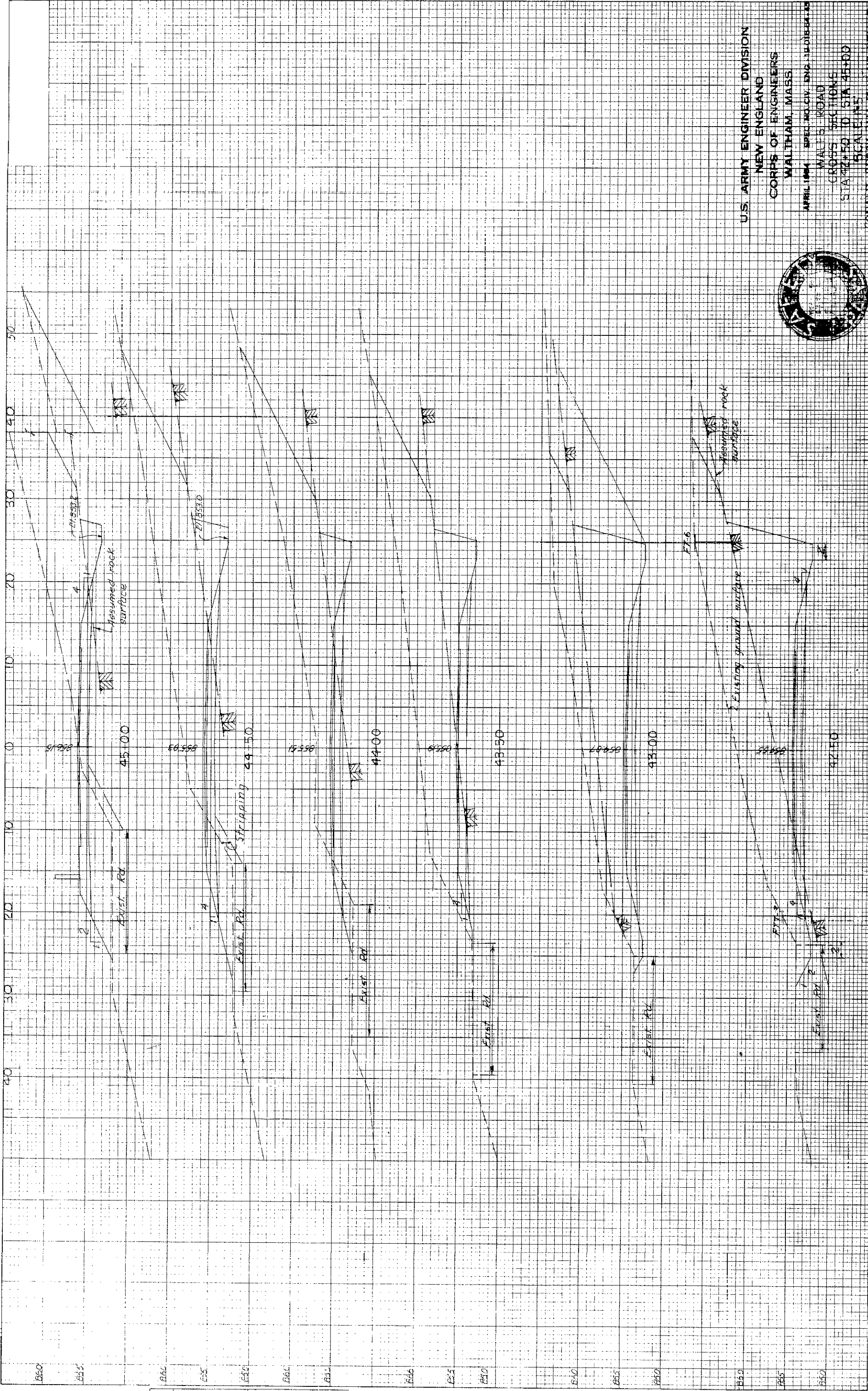
STA 26+00 TO STA 31+50

SCALE 1"=100'
CONST. BOOK 100, ENG. NO. 100, 101, 102



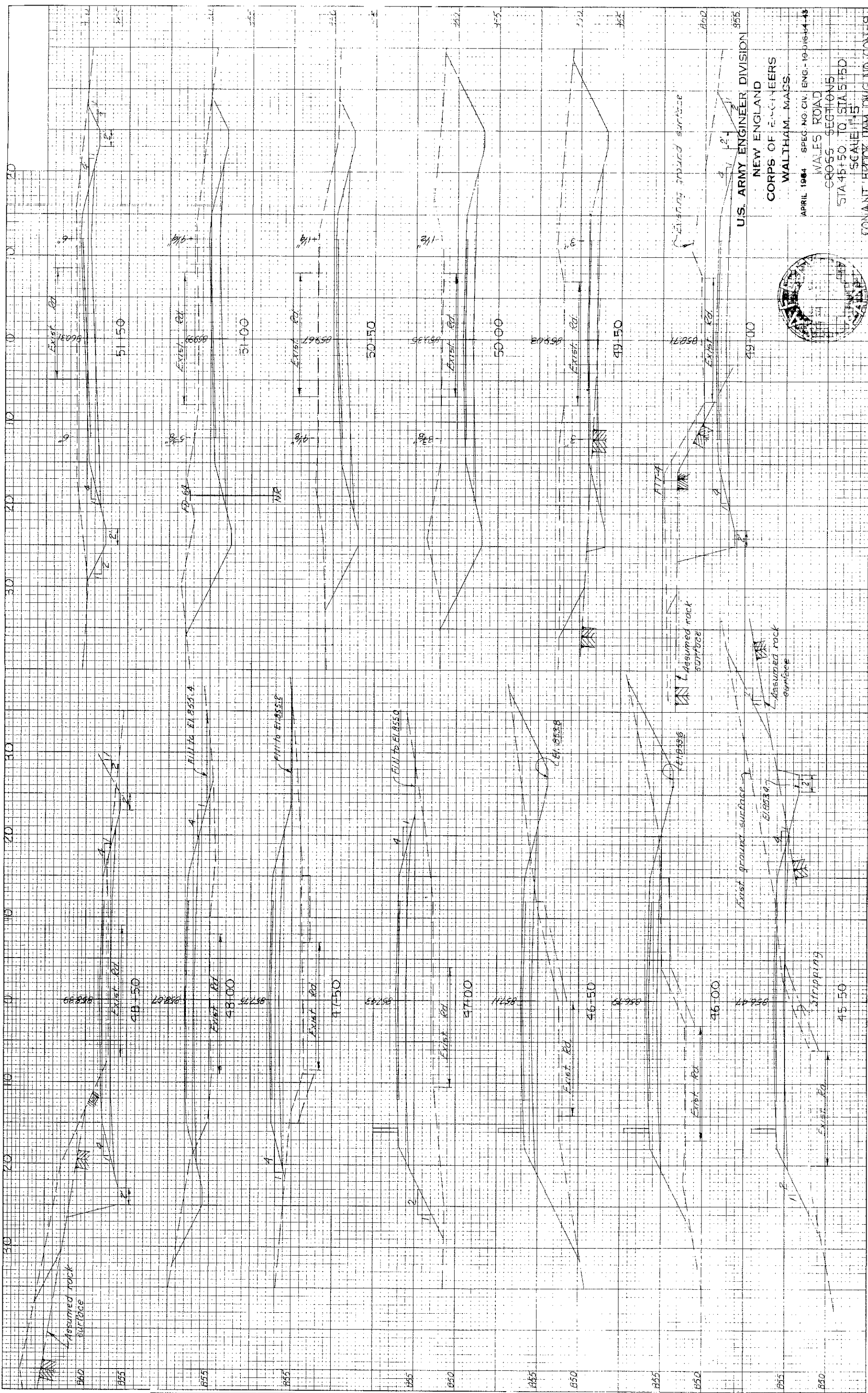
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC. NO. CIV. ENG. 19-018-54-03
WALLES ROAD
CROSS SECTION 5
STA. 39+00 TO STA. 42+00
SCALE 1:125
CONJANT BROOK DAM TOWNSHIP, MASS.



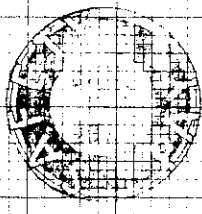
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC. NO. CIV. ENG. 1001-54-10
WALTHAM ROAD
CROSS SECTIONS
STATIONED TO STA 48+00
SCALE 1" = 100'
QUANT. BLOCK DAM DWG. NO. 1001-54-10

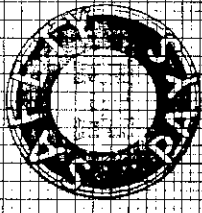
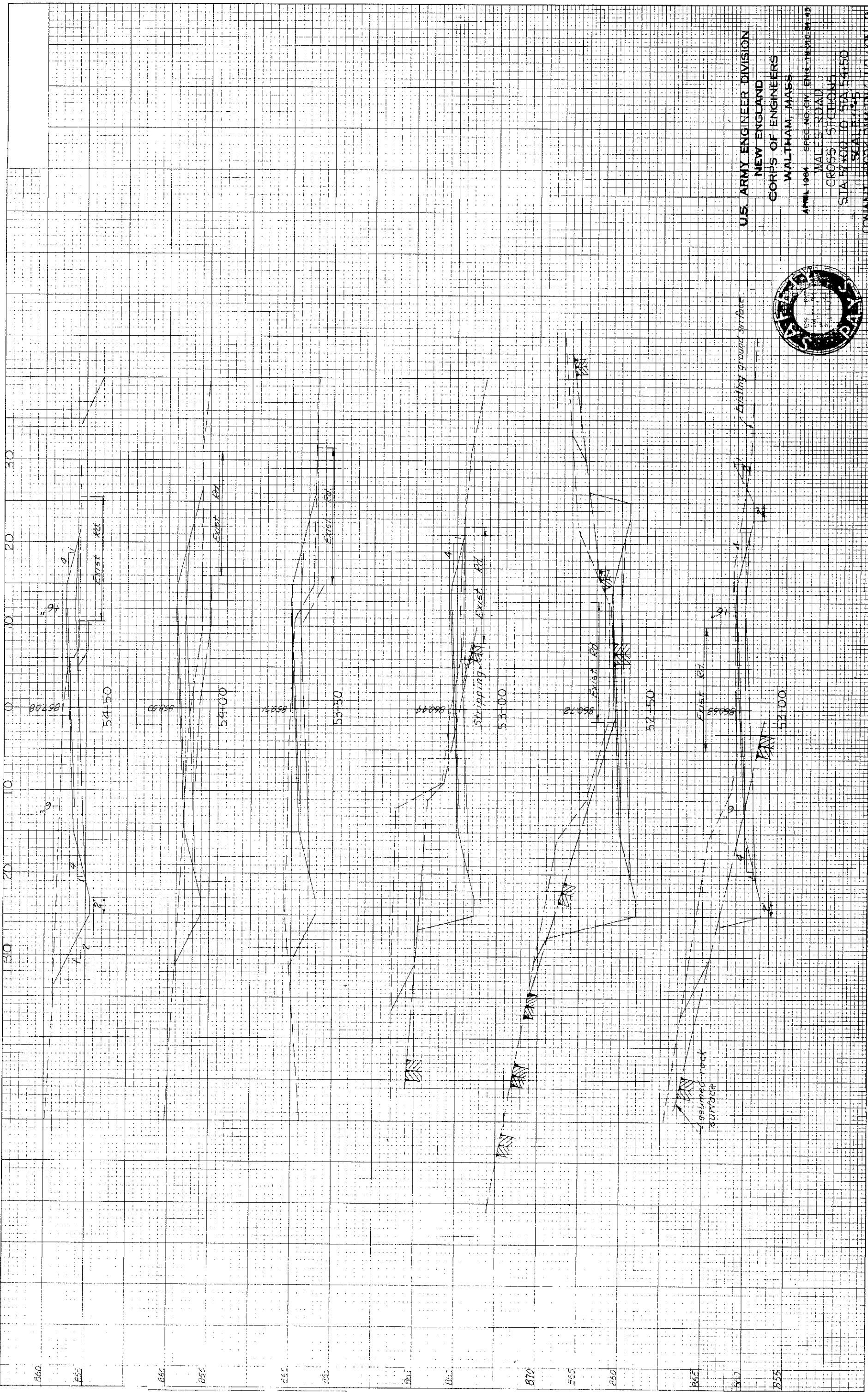


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| NO | DATE | BY |
| FINAL | | |
| SURVEY | | |
| PLOTTED | | |
| NOTED | | |
| REVISION | | |
| AREA CHECKED | | |
| DATE | | |

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|--------------|------|----|
| NO | DATE | BY |
| ORIGINAL | | |
| SURVEY | | |
| PLOTTED | | |
| NOTED | | |
| REVISION | | |
| AREA CHECKED | | |
| DATE | | |

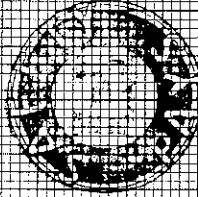
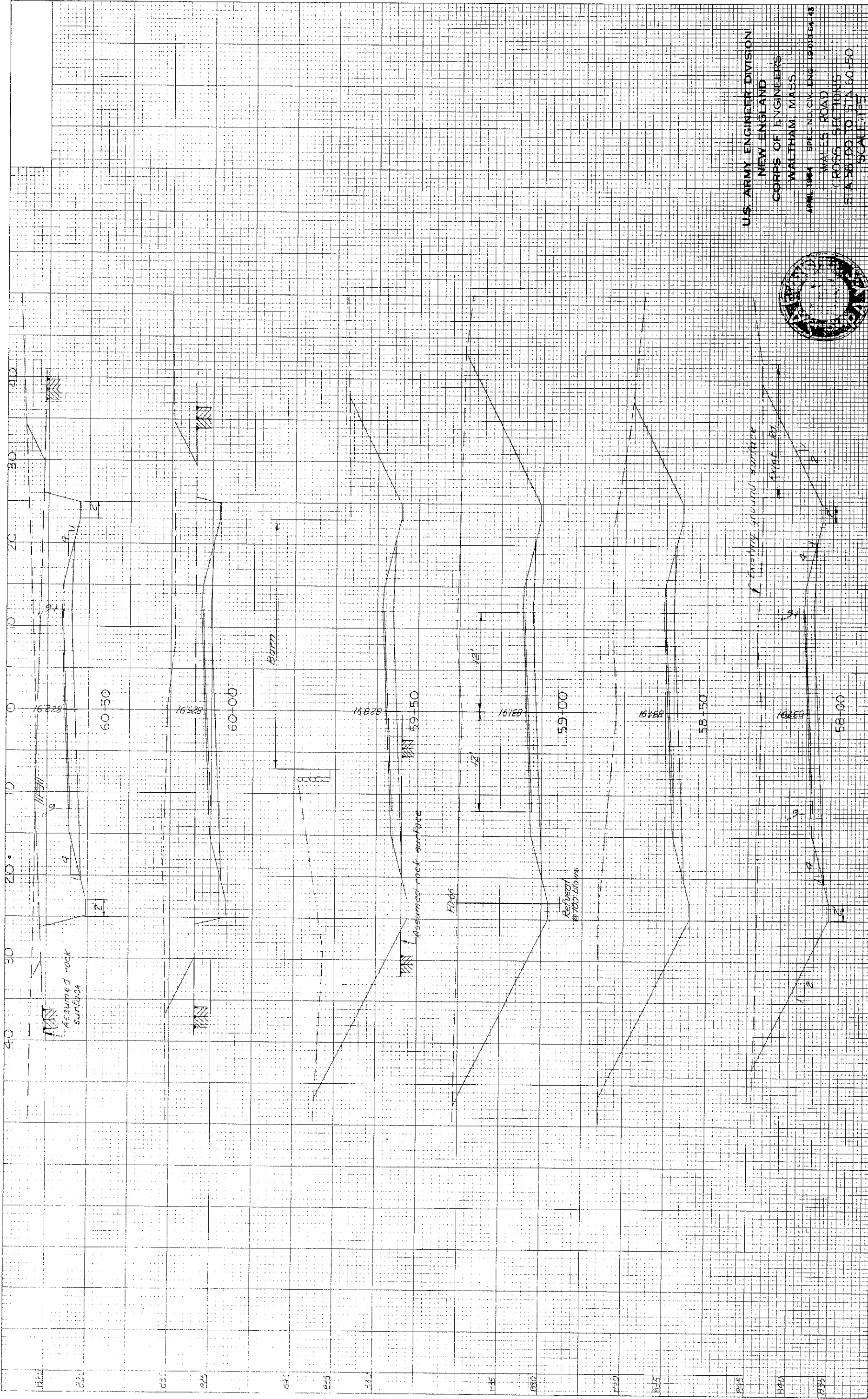


U.S. ARMY ENGINEER DIVISION 955
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. - 19-16-64-13
MALES ROAD
CROSS SECTIONS
STA 46+50 TO STA 51+50
SCALE 1"=15'
CONANT BROOK DAM Dwg NO. CON-19



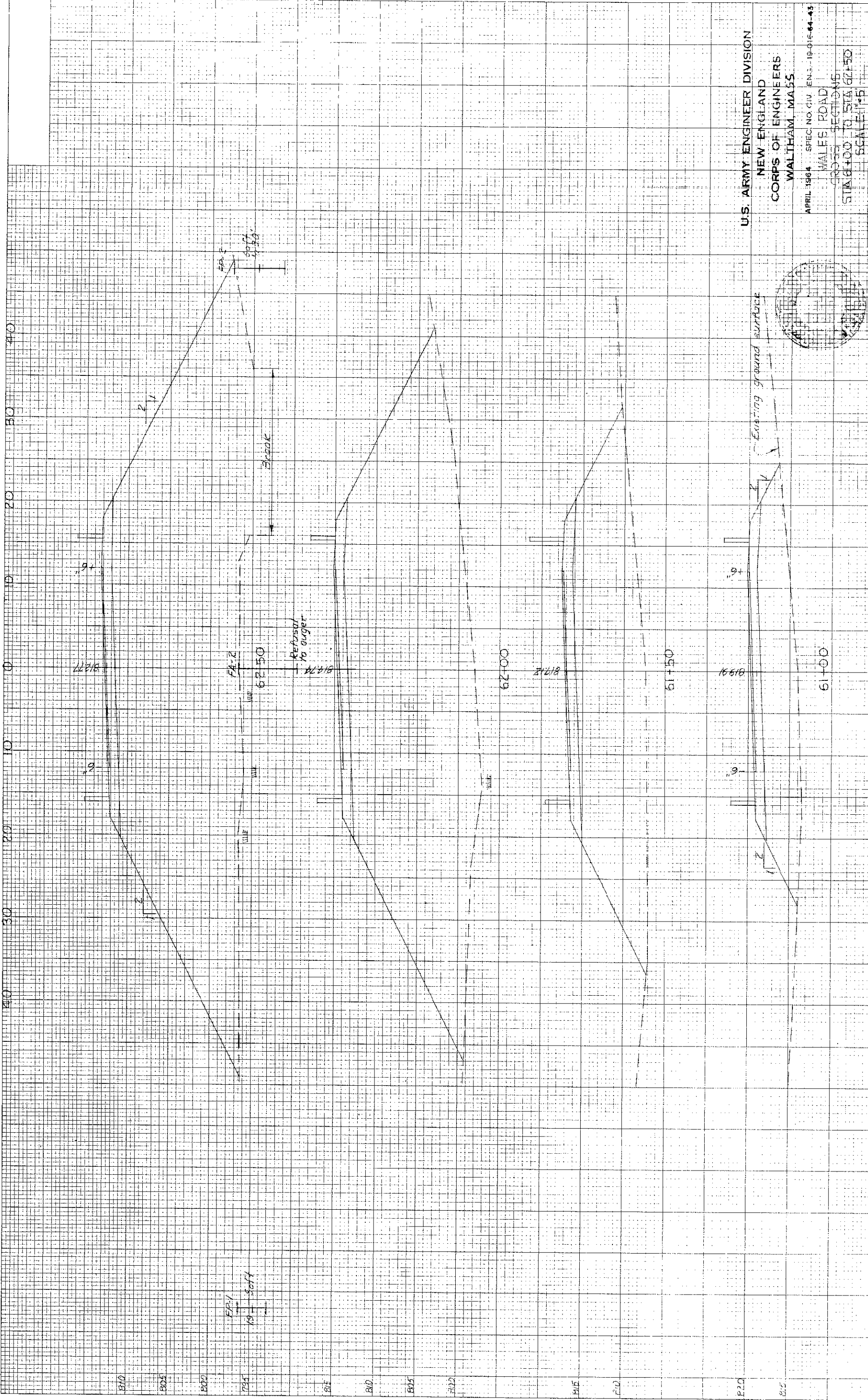
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC. NO. CIV. ENG. 18-016-24-43
WALES ROAD
CROSS SECTION
STA 52+00 TO STA 54+50
SCALE 1"=25'
CONJUNCT BOOK DRAWING NO. 001-19



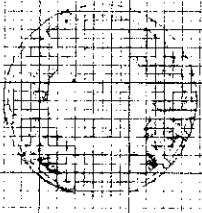
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

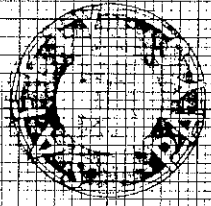
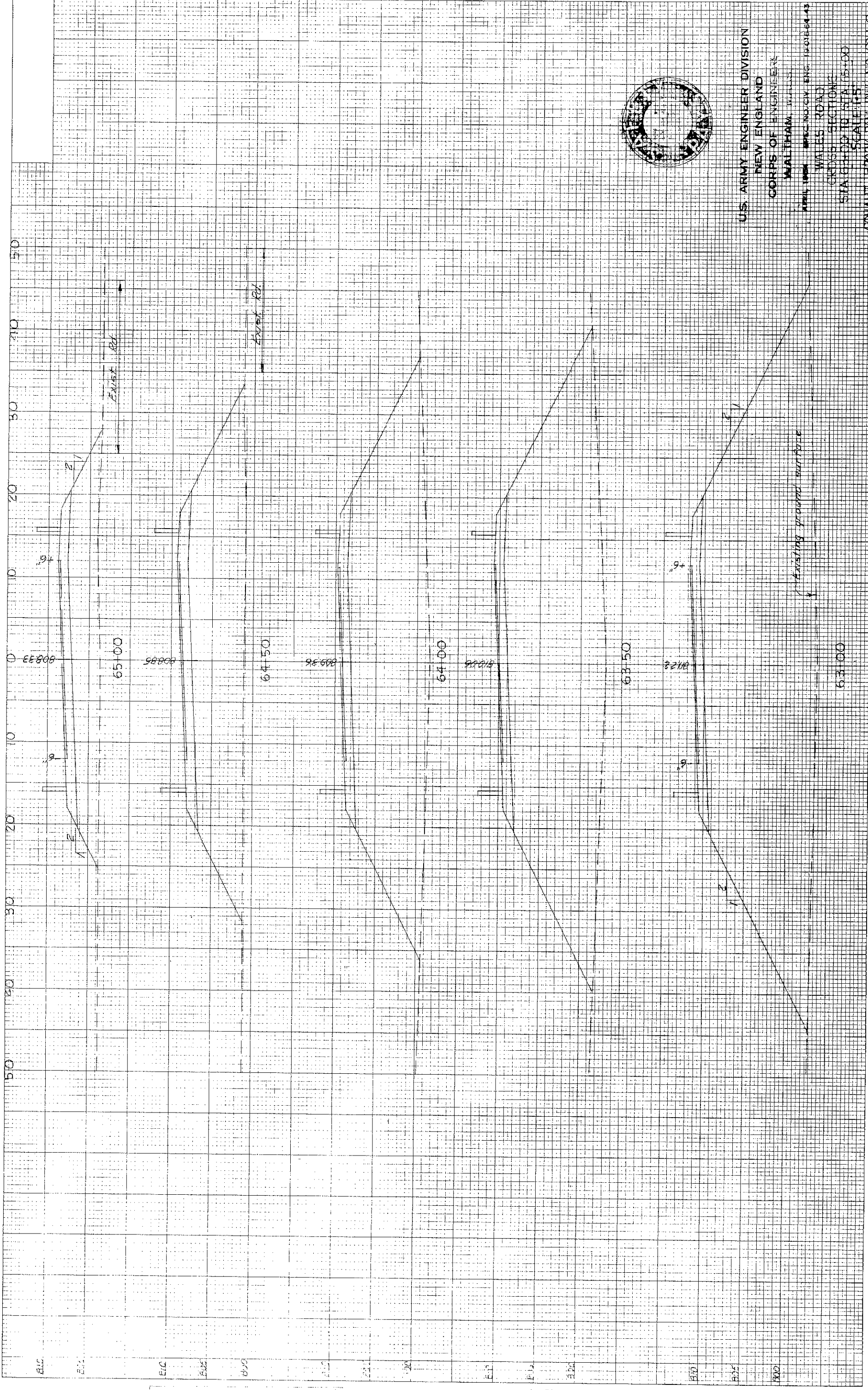
APR 1964 SPEC NO. CV ENG 1001804-43
WALLES ROAD
(ROAD SECTION)
STA 58+00 TO STA 60+50
SCALE: 1"=10'
QUANT. BROOK DAY DME NO. 070119



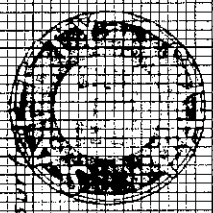
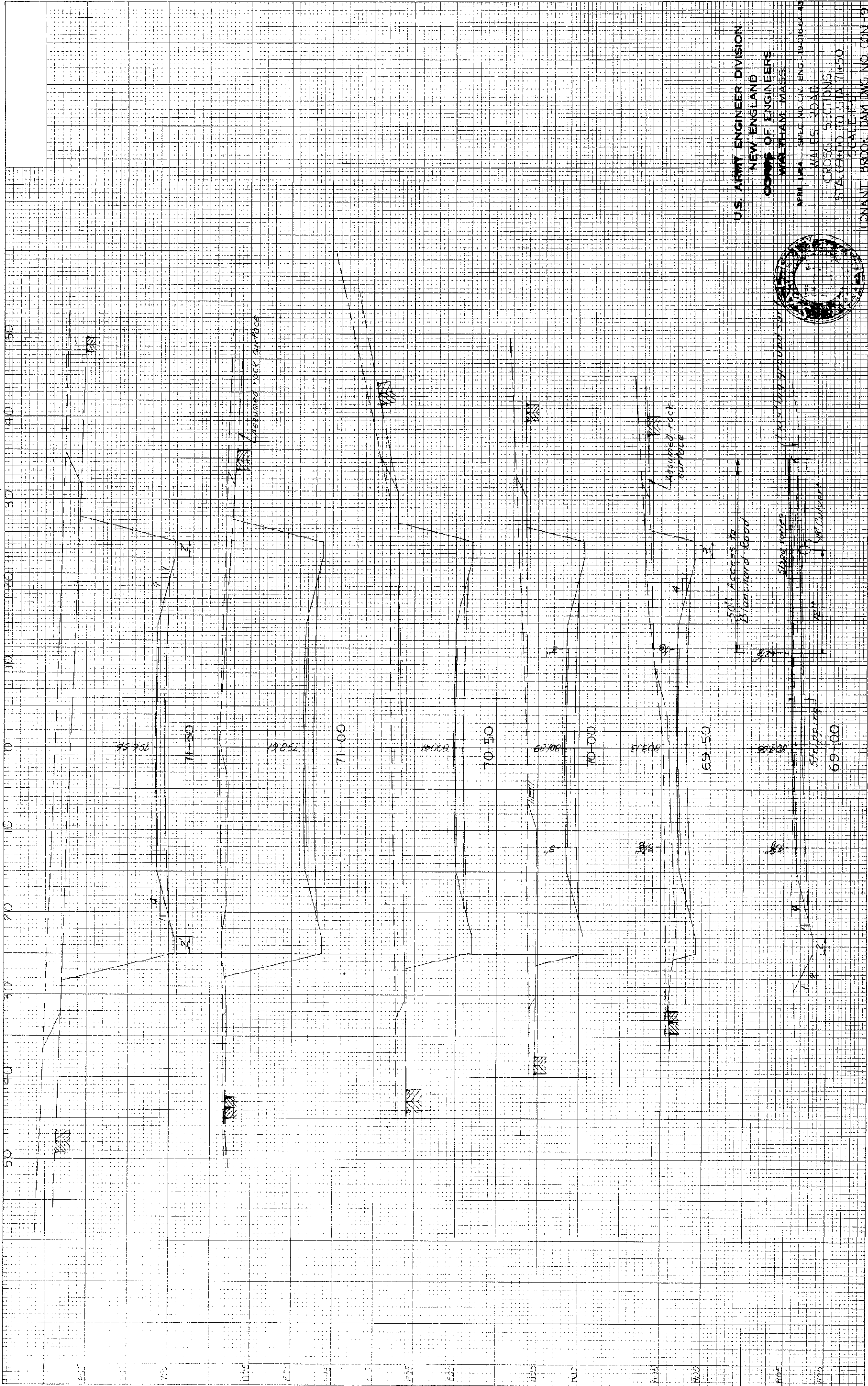
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MA 55

APRIL 1964 SPEC NO CIV EN-3-19-01-6-64-43
WALFORD ROAD
CROSS SECTION
STA 61+00 TO STA 62+50
SCALE: 1"=5'





U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1944 SPEC. NO. 100-100-100-100-100
WALTON ROAD
CROSS SECTION
STATIONED TO STA. 15+00
SCALE 1\"/>

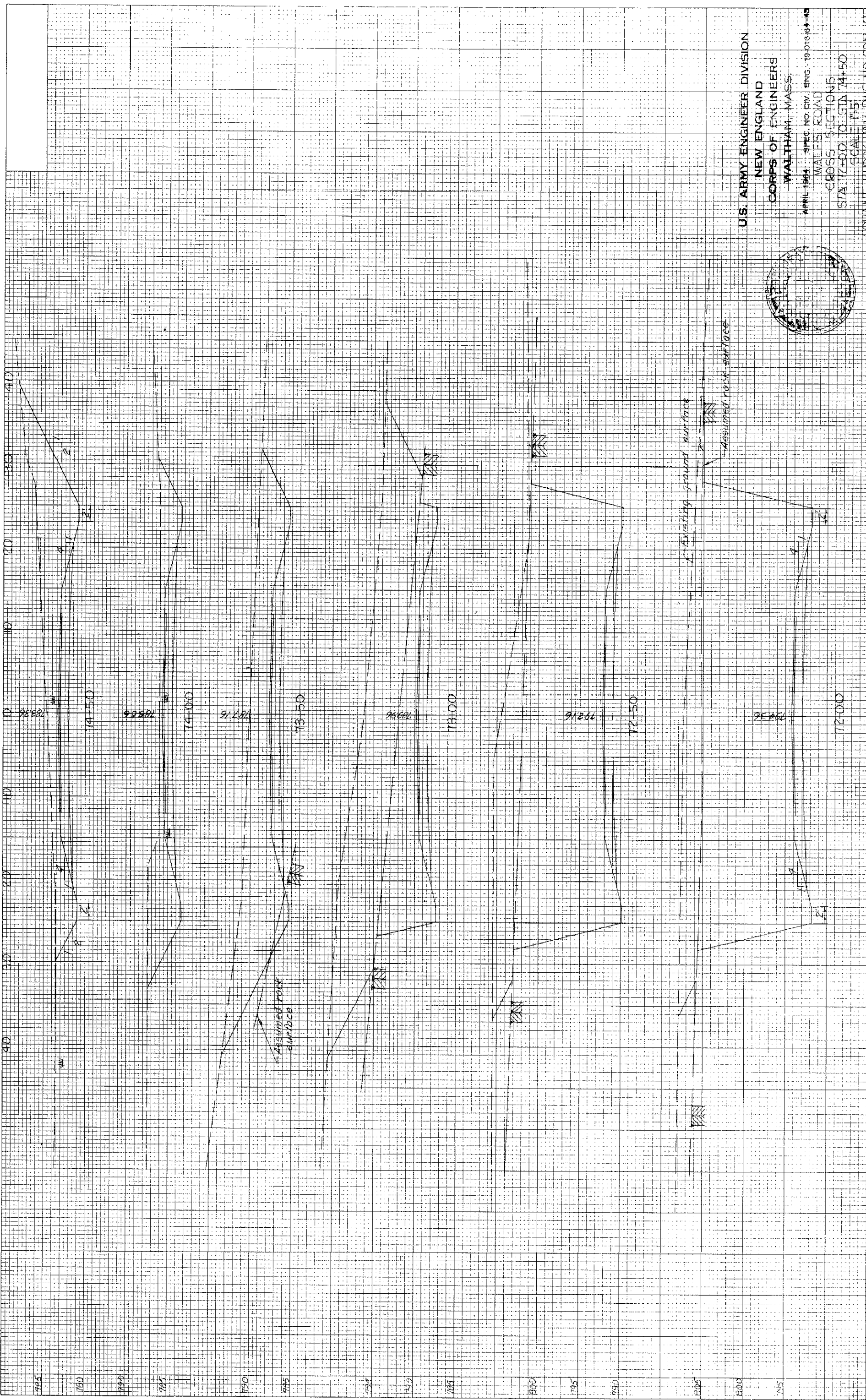


U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
COMPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC NO. CIV. ENG. 19-016-64-43

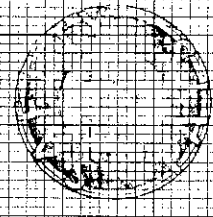
MALES ROAD
CROSS SECTIONS
STA 69+00 TO STA 71+50
SCALE 1"=15'

CONVANT BROOK DAY DWT NO. CONT 19

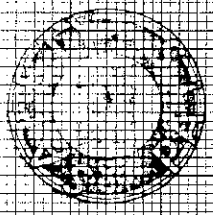
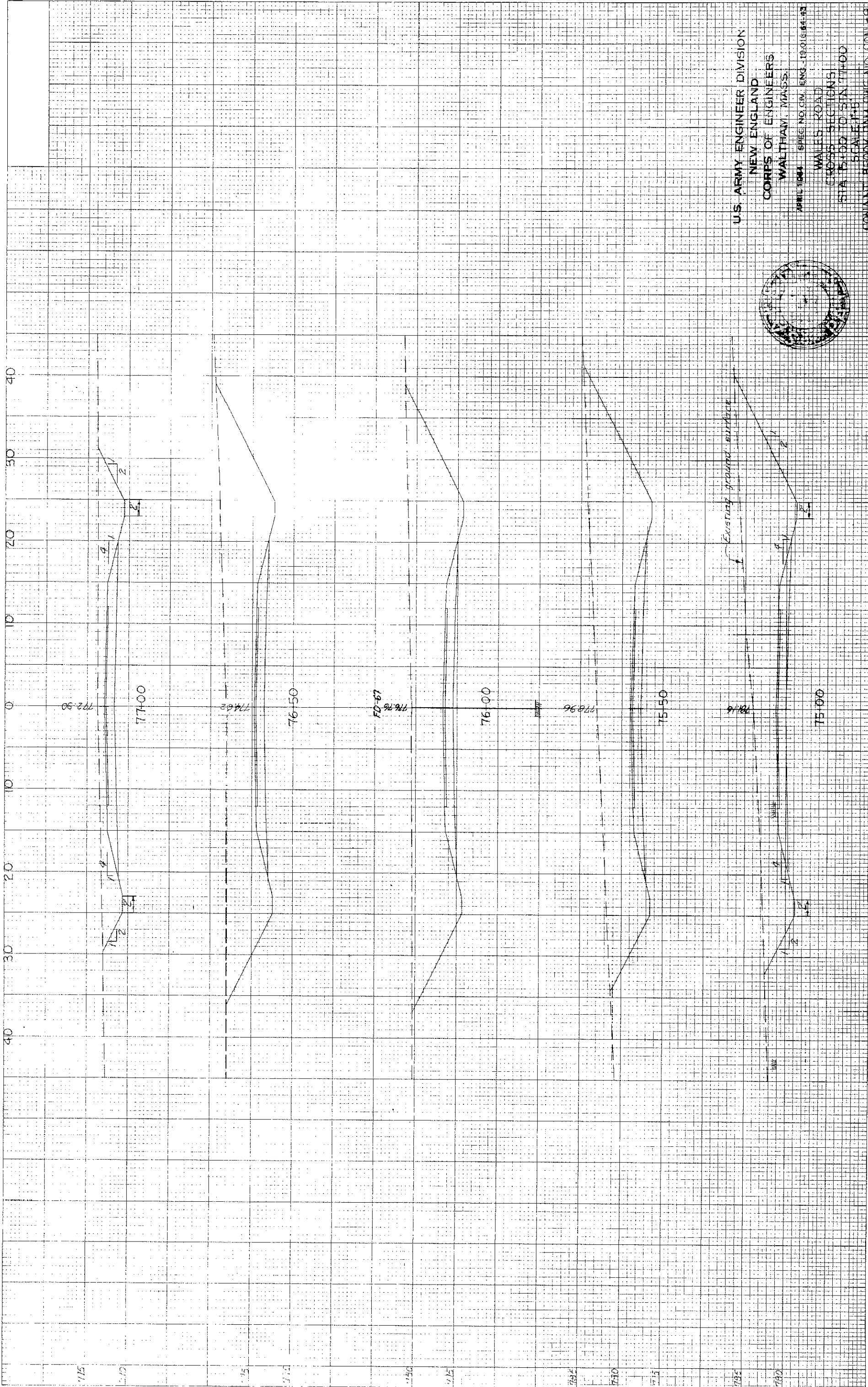


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| DATE | BY |
| FINAL SURVEY | |
| NO. 1000 | |
| NOTE BOOK | |
| APPROVED | |
| SIGNED | |
| DATE | |

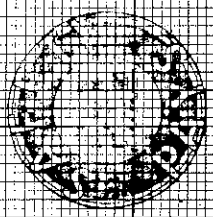
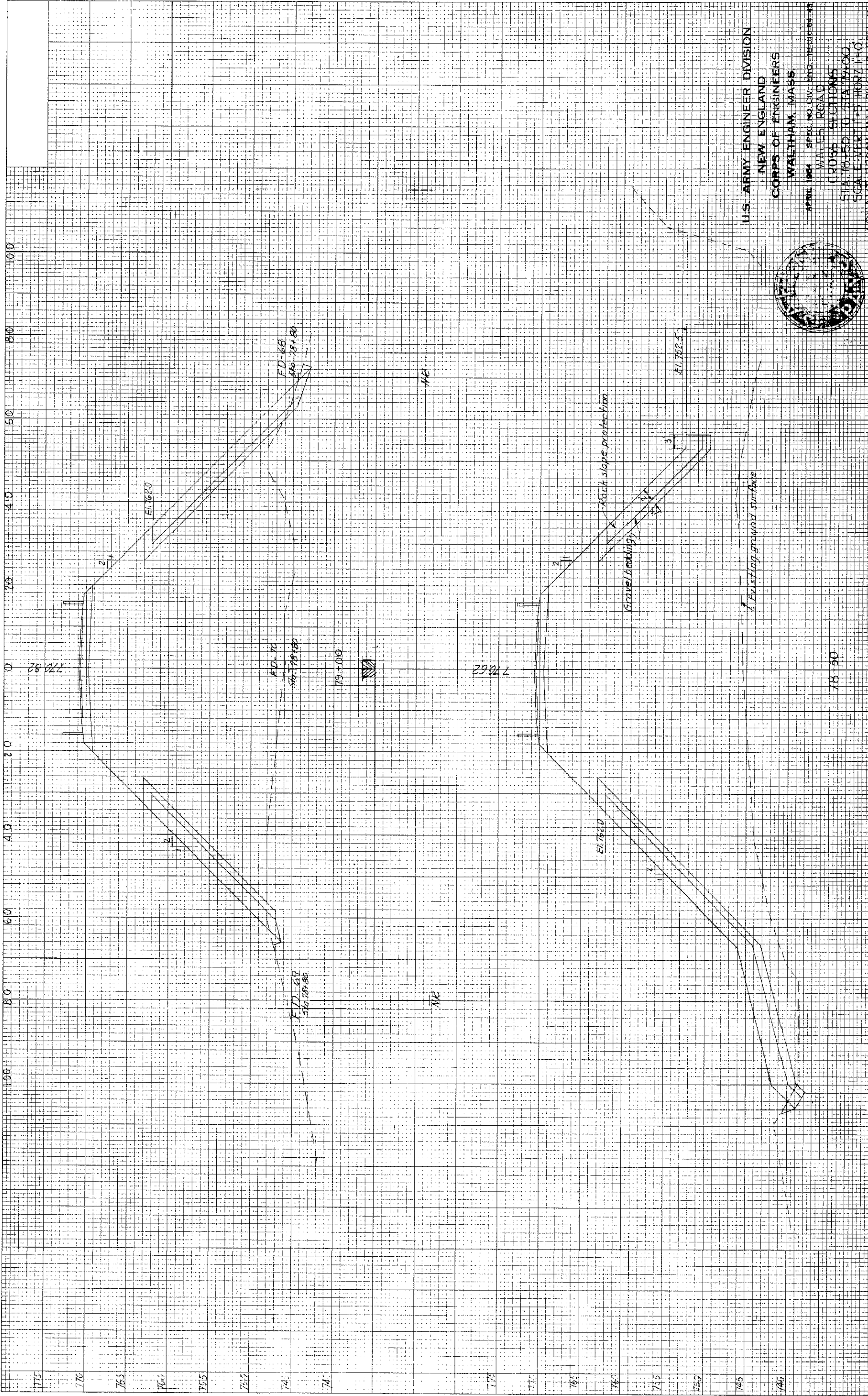
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| DATE | BY |
| ORIGINAL SURVEY | |
| NO. 1000 | |
| NOTE BOOK | |
| APPROVED | |
| SIGNED | |
| DATE | |



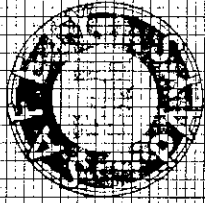
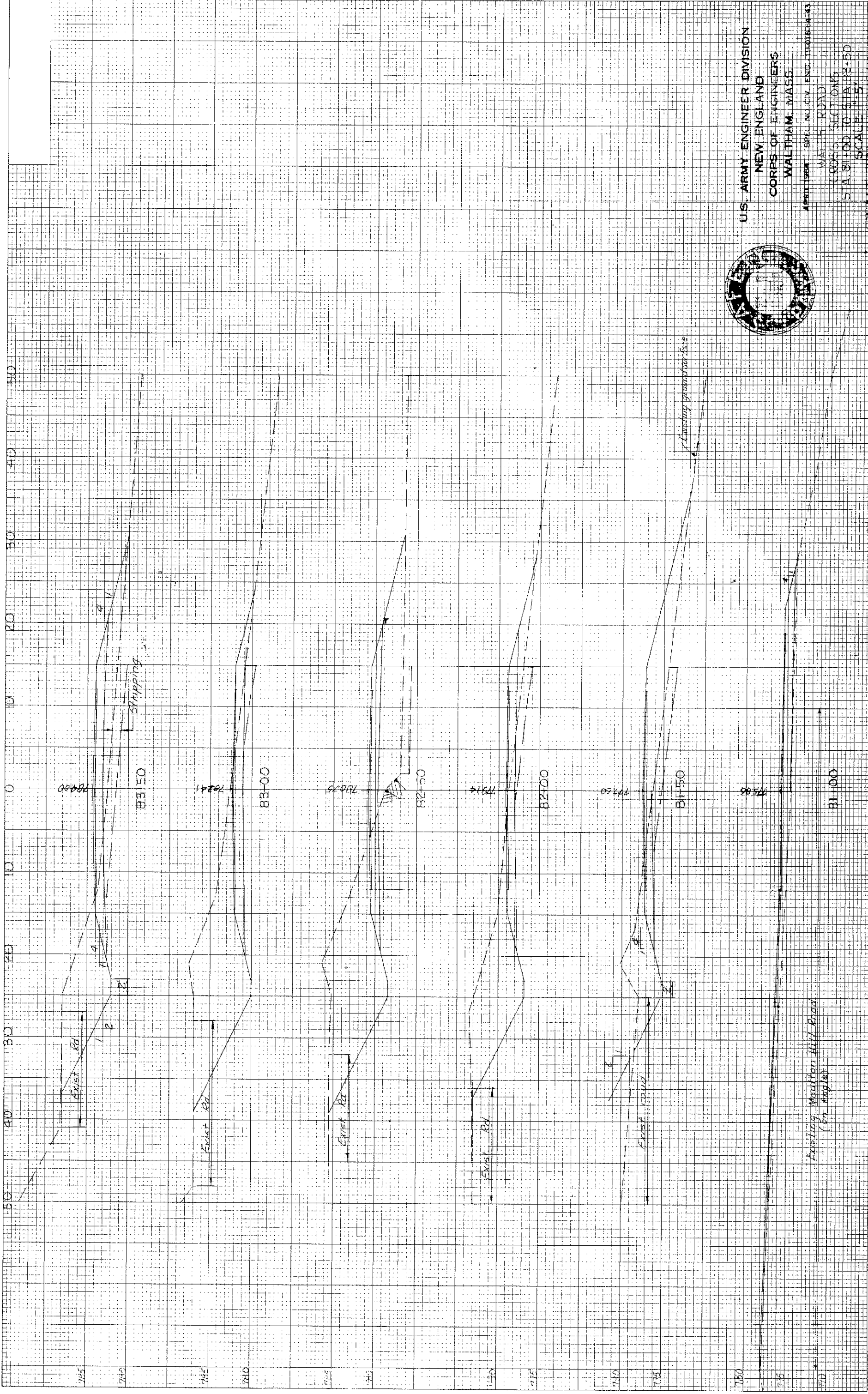
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. - 19-016-04-43
MALES ROAD
CROSS SECTION 5
STA. 72+00 TO STA. 74+50
SCALE: 1" = 20'
CONVANT BROOK DAM - DMG NO. 10001-91



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC NO. CM. ENG. 19.0.64-42
WALLES ROAD
CROSS SECTIONS
STA 15+00 TO STA 17+00
SCALE 1"=10'
CONVANT BROOK DAM DWG NO. CON-19
SHEET 33

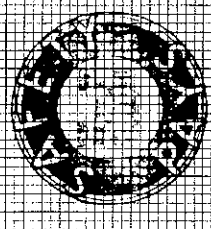
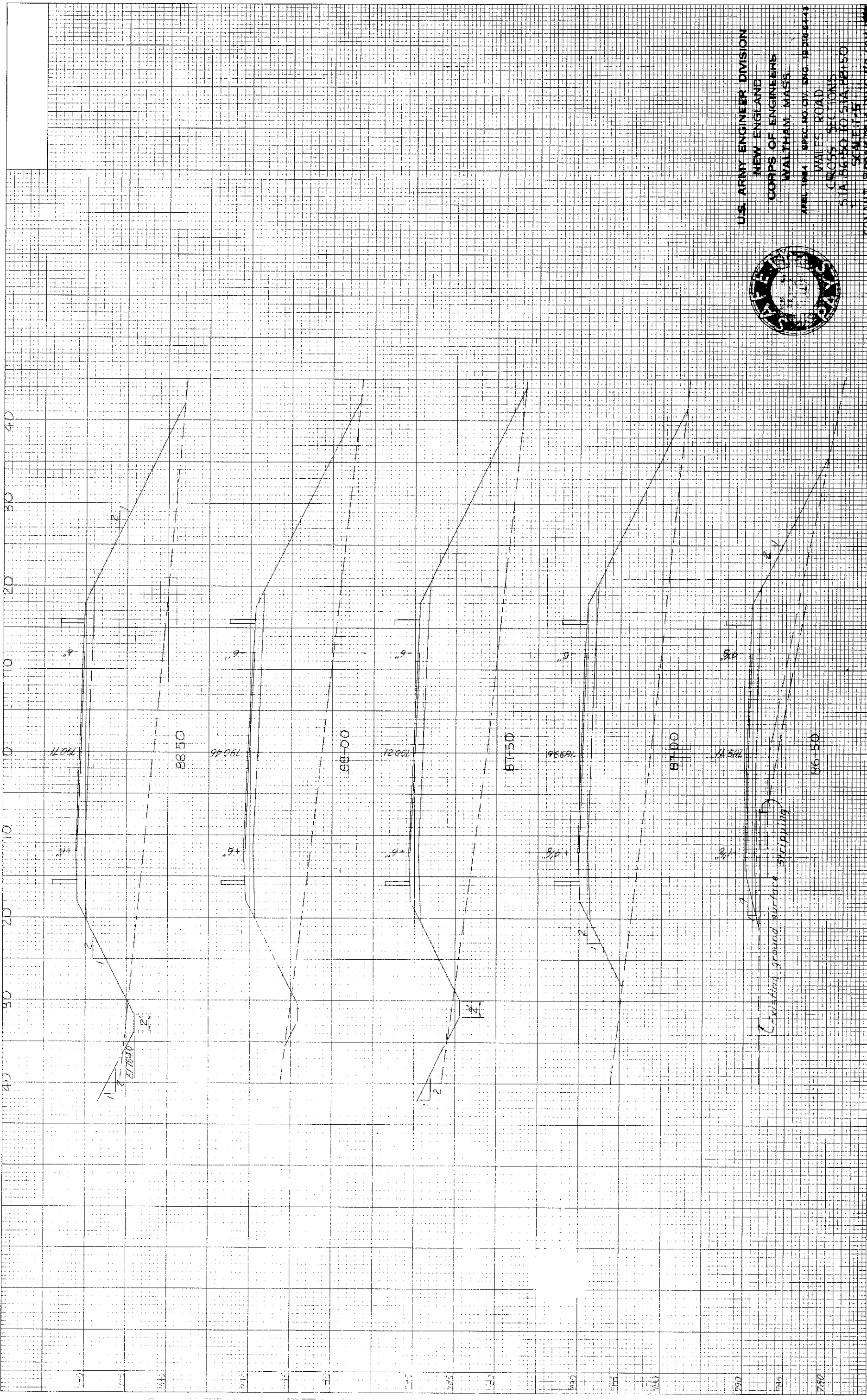


U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. 18-016-B4-43
WATLES ROAD
(CROSS) SECTIONS
STA. 18+50 TO STA. 19+00
SCALE VERT. 1\"/>

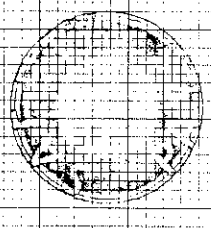
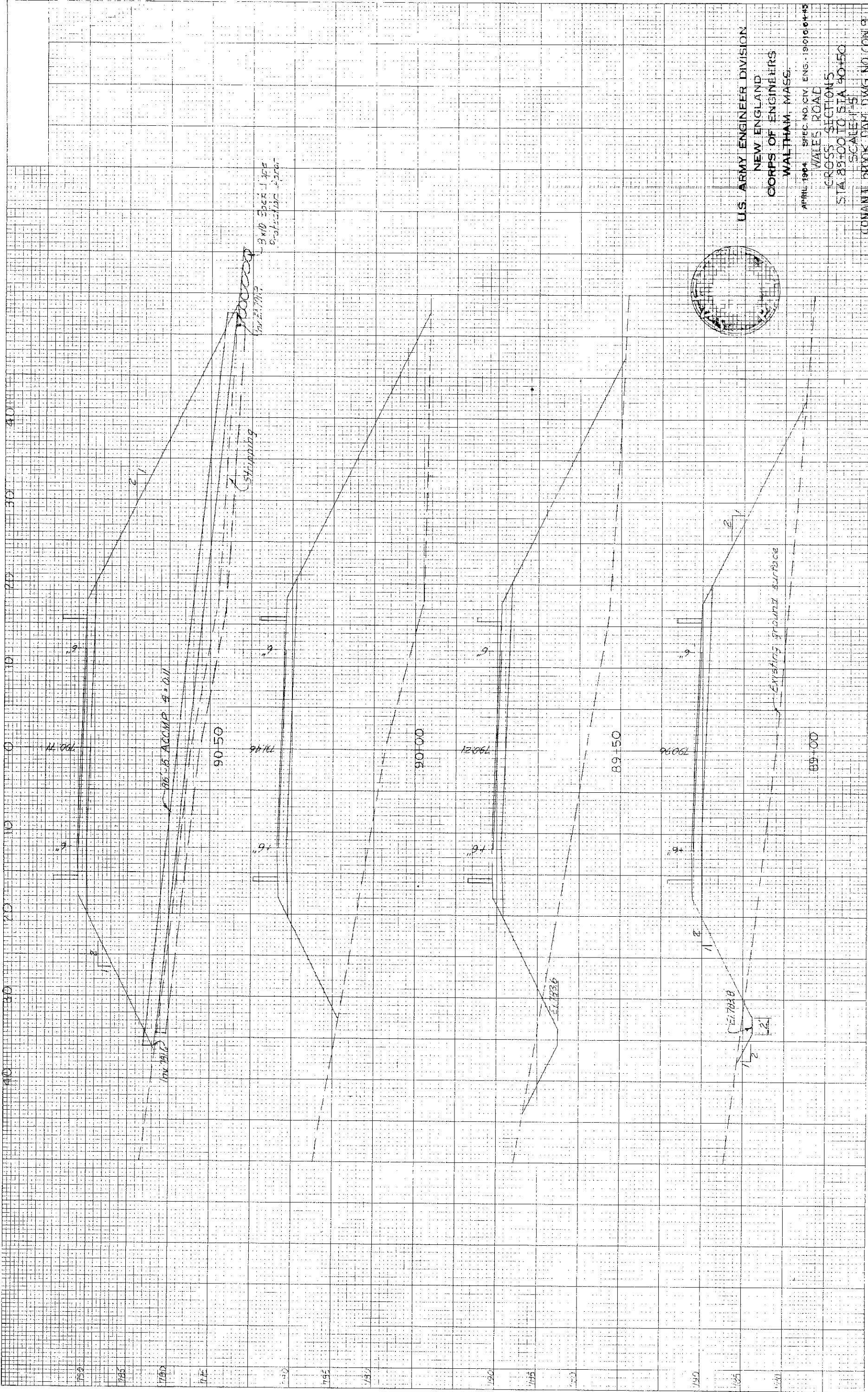


U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC. NO. CIV. ENG. 115016-04-43
WALTHAM ROAD
CROSS SECTION
STA. 81+00 TO STA. 82+50
SCALE 1" = 5'
CONSTANT BROOK JAM DWG. NO. 1001-9



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1941. SPEC. NO. 317. ENG. 10018-5143
WALLES ROAD
CROSS SECTIONS
STA 86+50 TO STA 88+50
SCALE 1" = 20'
CONTR. BOOK 10018-5143 NO. 317



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1904. SPEC. NO. CIV. ENG. 190106-43
WALLES ROAD
CROSS SECTIONS
STA 89+00 TO STA 90+50
SCALE 1"=5'
TUNANT BROOK DAM DWG NO. 10N19

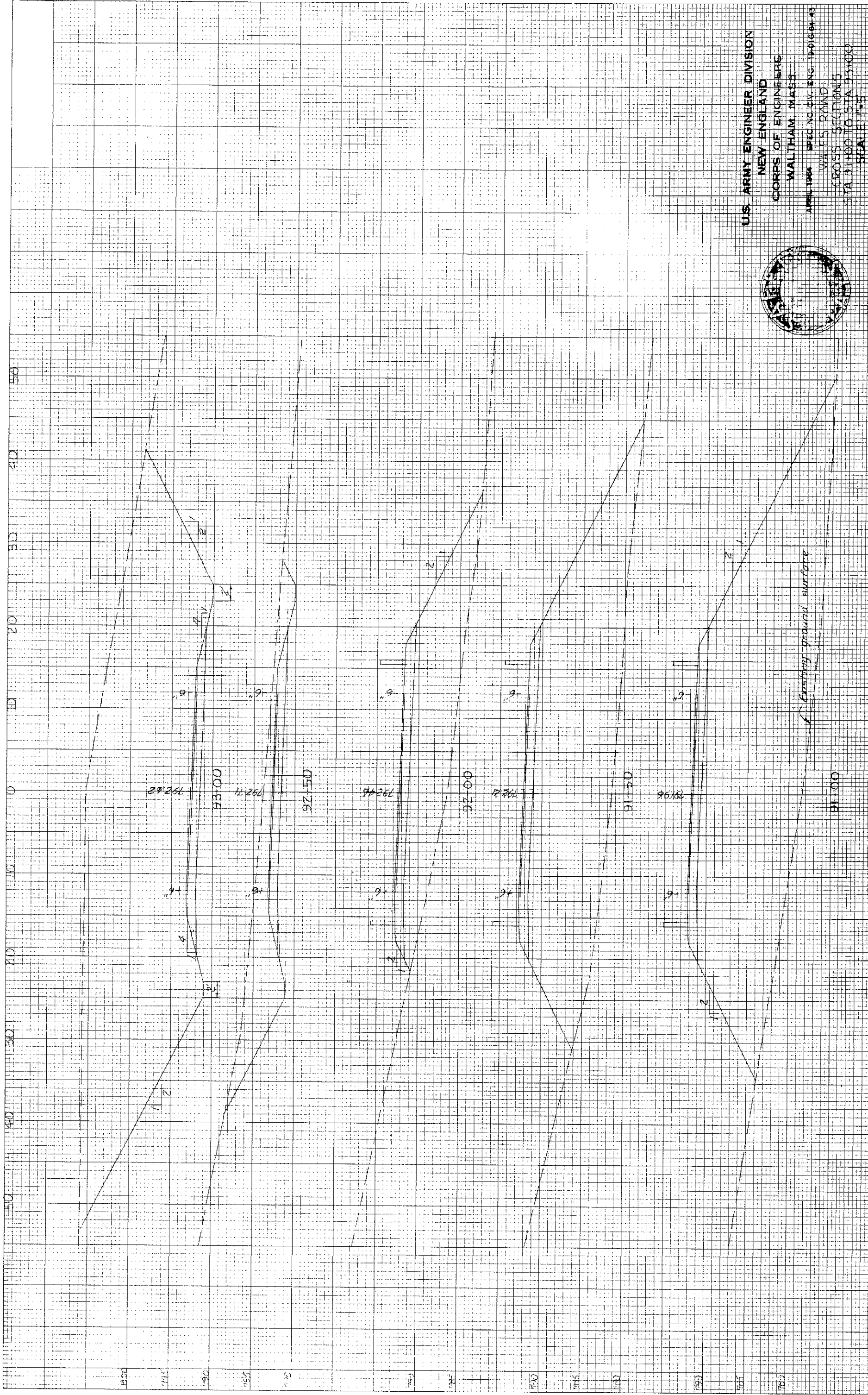
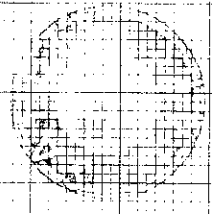
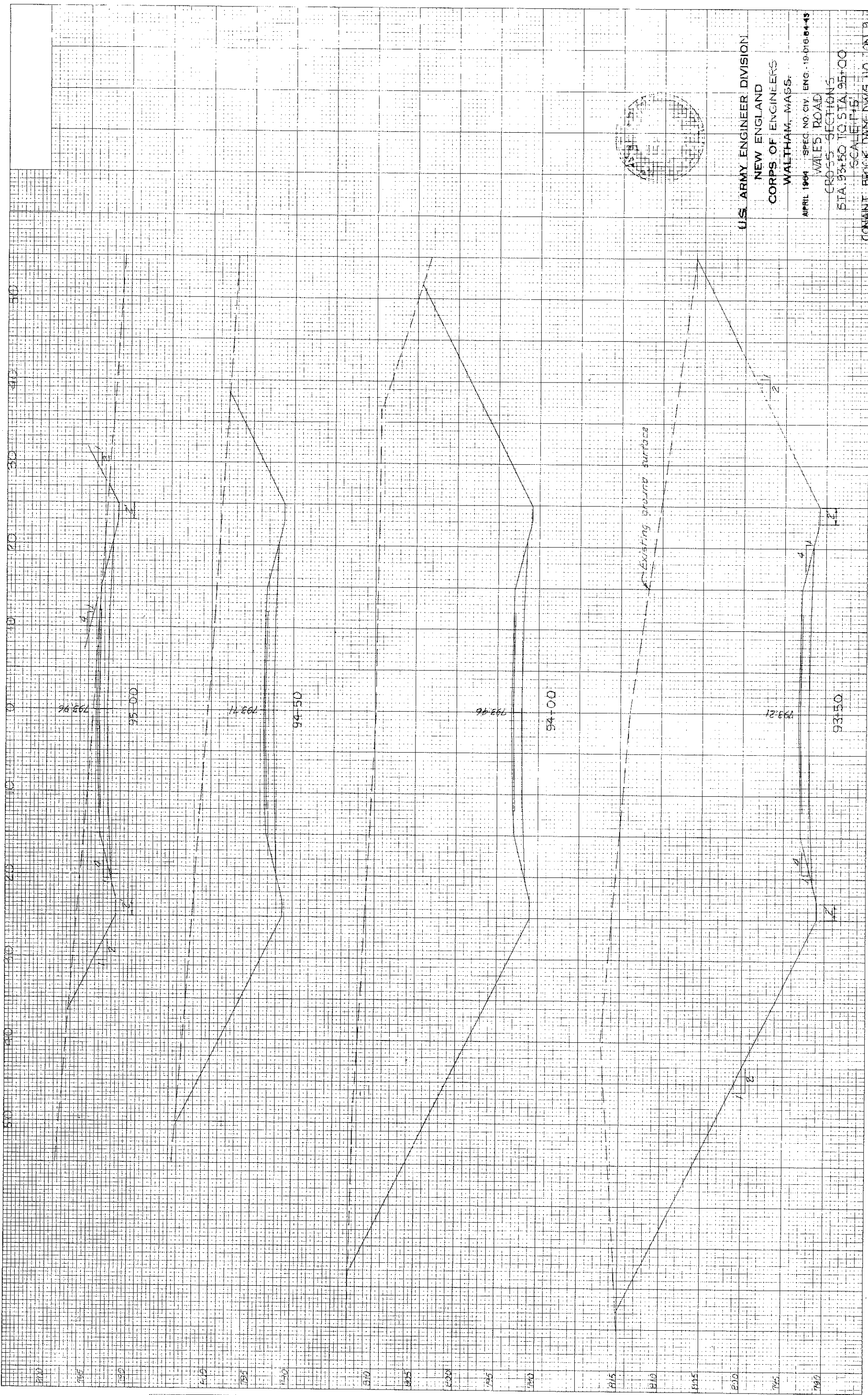


PLATE 3, CROSS SECTION
KEUFFEL & ESSER CO.

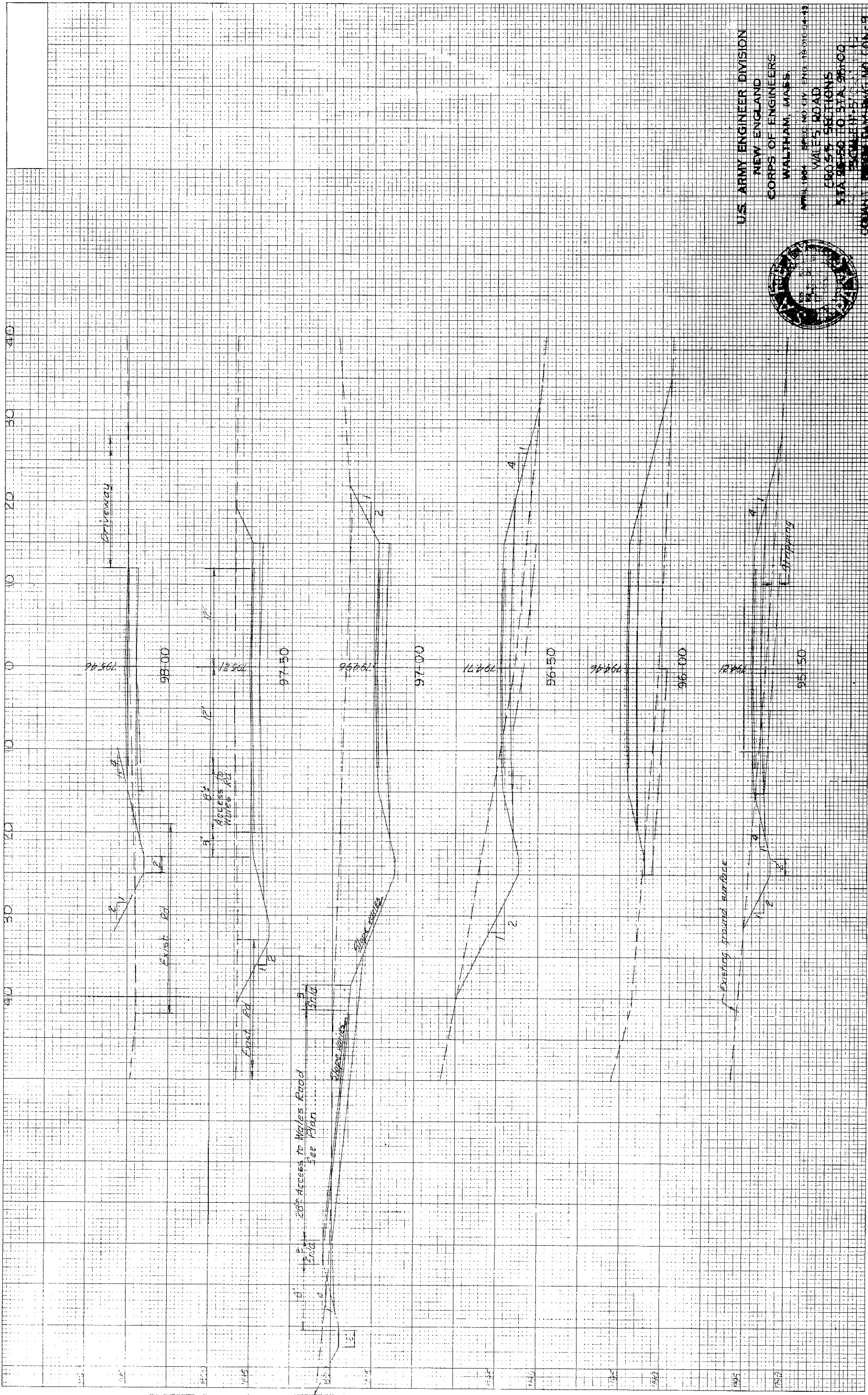
SHEET 41



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC NO. CIV. ENG. 19-016-04-43
WALTON ROAD
CROSS SECTIONS
STA. 93+50 TO STA. 95+00
SCALE: 1" = 10'
CONANT, BROOK DAME DWG. NO. 10N. 1.1

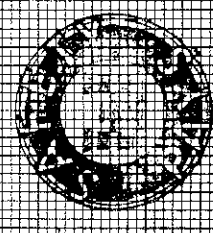
FINAL
SURVEY
NO. 100
DATE 10/1/64

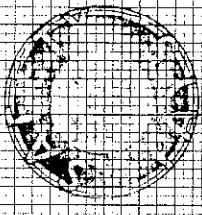
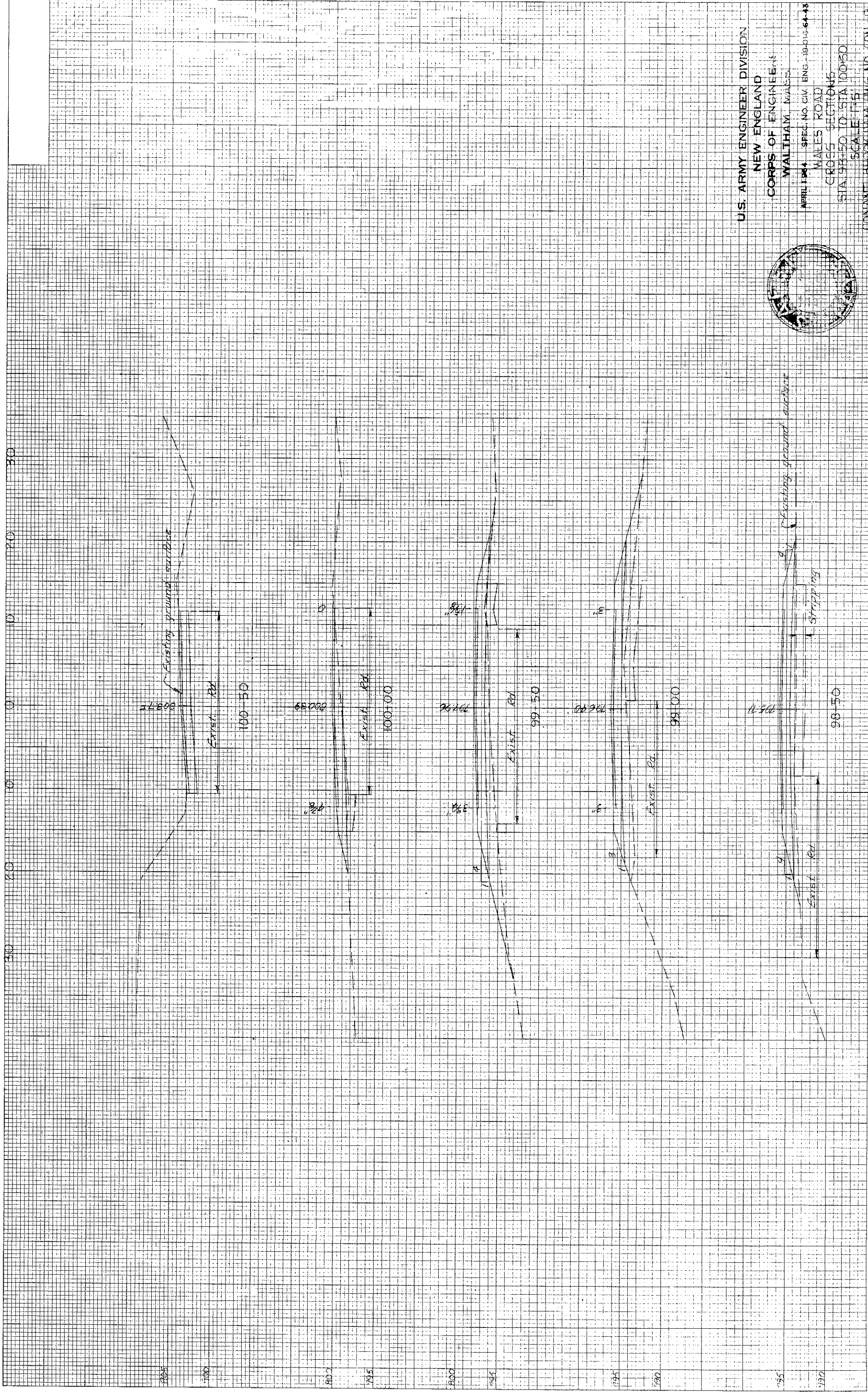
ORIGINAL
SURVEY
NO. 100
DATE 10/1/64



U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS

APRIL 1964 SPEC NO. CIV. ENG. 15-016-54-43
WALTON ROAD
CROSS SECTIONS
STA 9550 TO STA 9600
PROJECT 11-57
CONTRACT 11-57-1-12



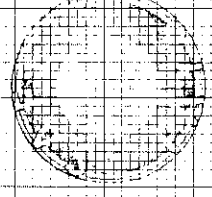
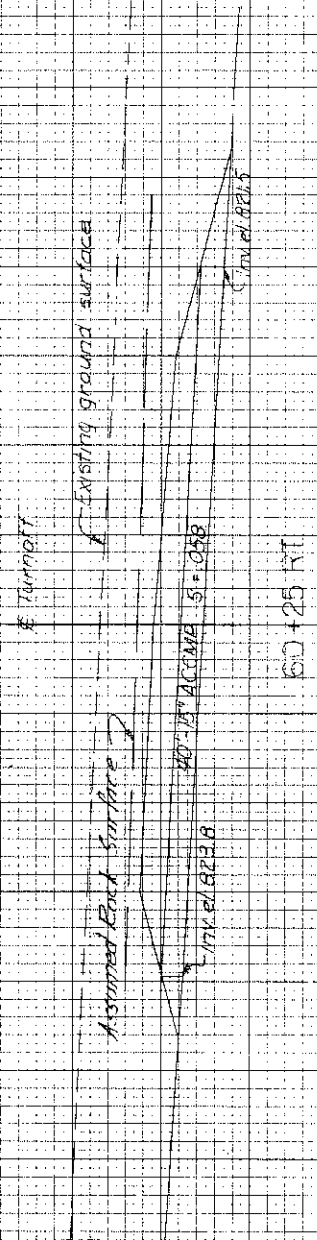
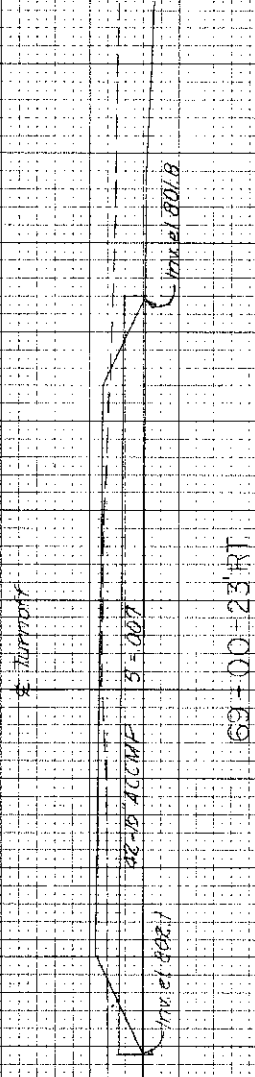


U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1944 SPEC. NO. CIV. ENG. - 10-0-15-64-48
WALLS ROAD
CROSS SECTIONS
STA. 98+50 TO STA. 100+50
SCALE: 1" = 15'
CONSTANT BRICK DAM DWG. NO. 10N 19

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| BY | |
| FINAL SURVEY | |
| NOTE BOOK | |
| APPROVED | |
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| NO. | DATE |
| BY | |
| ORIGINAL SURVEY | |
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U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC NO DIV. ENG-19-DIG-64-43
MALES ROAD
SECTION

WALTHAM, MASS.

APRIL 1964 SPEC NO DIV. ENG-19-DIG-64-43
MALES ROAD
SECTION

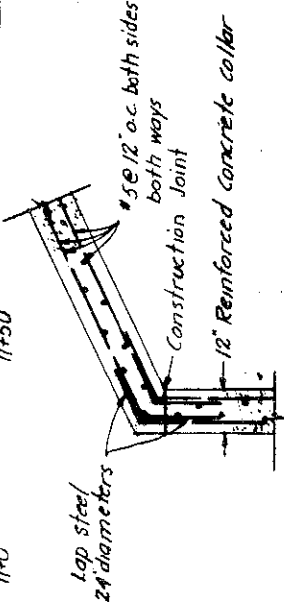
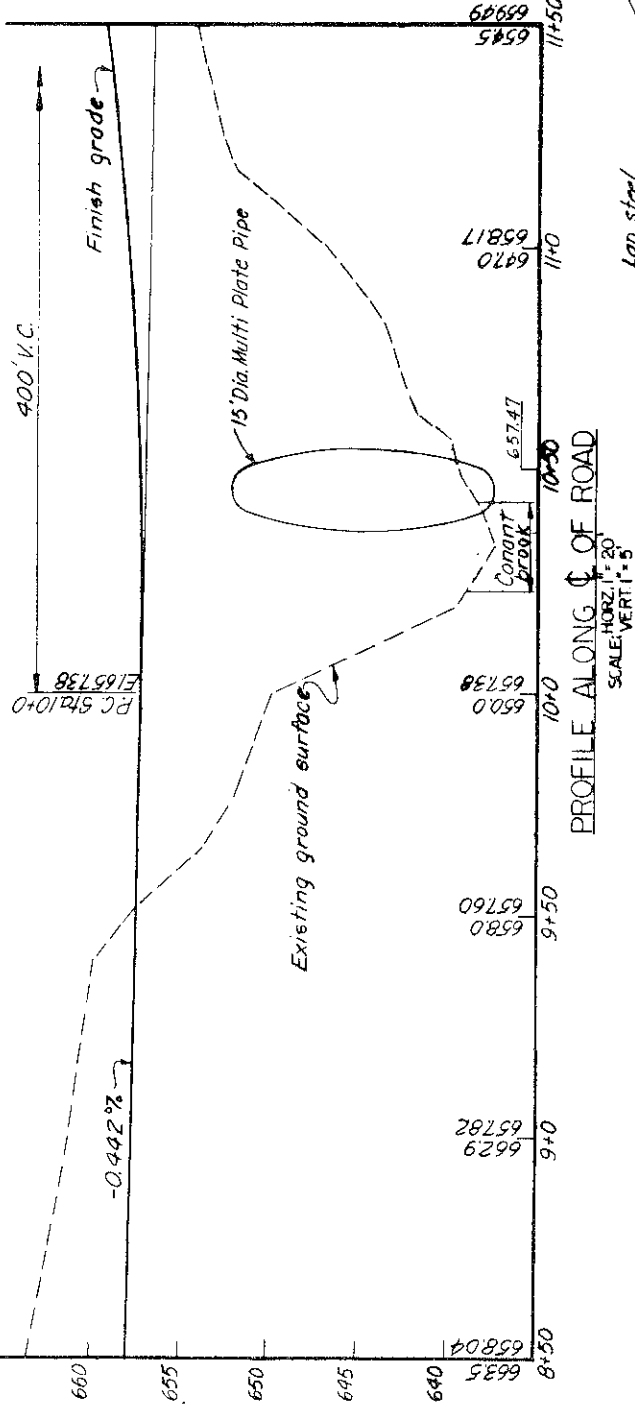
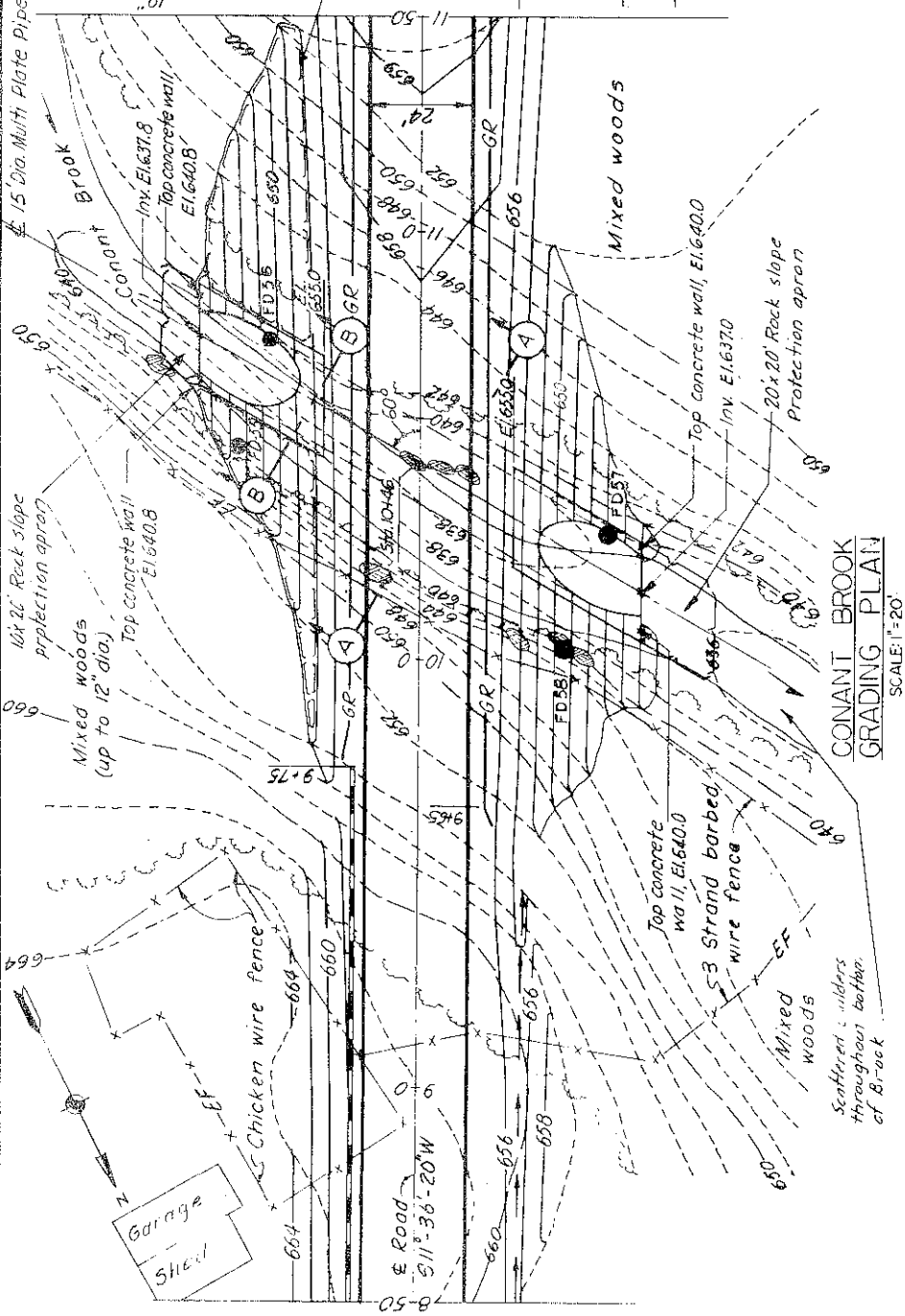
MALES ROAD

NOTHING

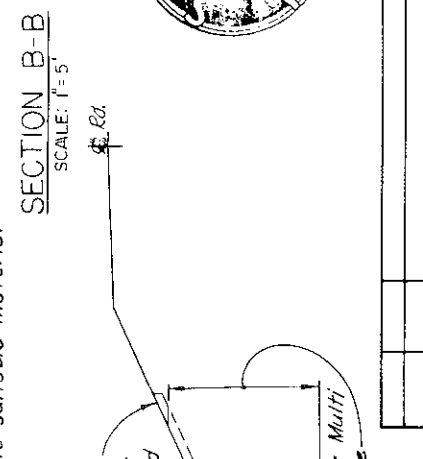
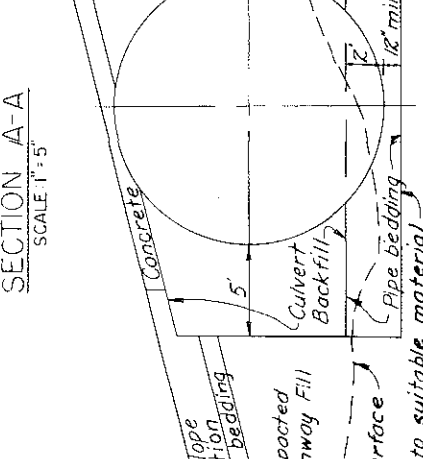
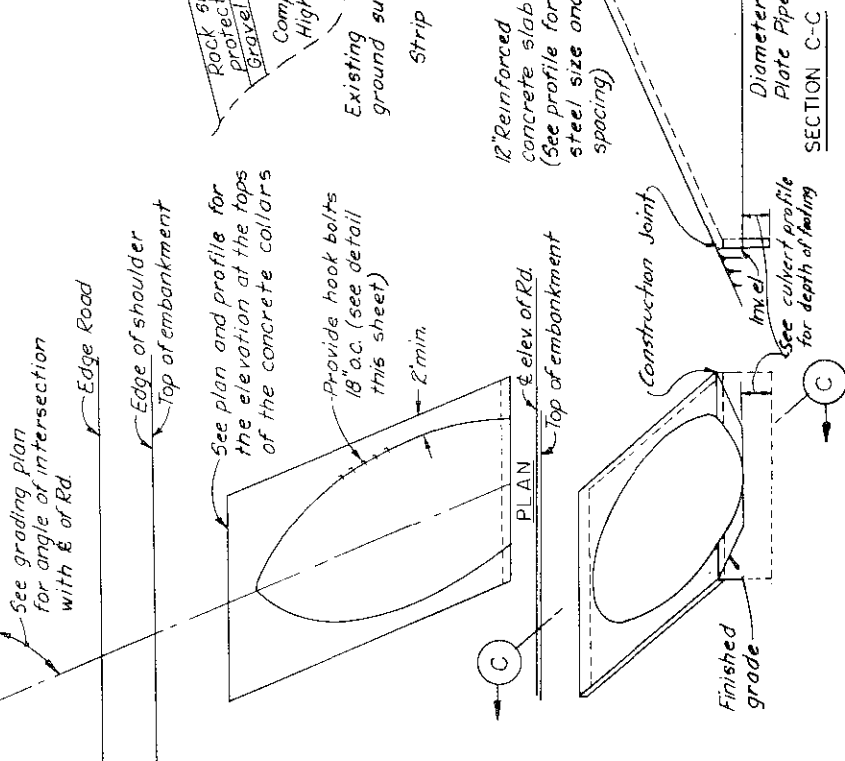
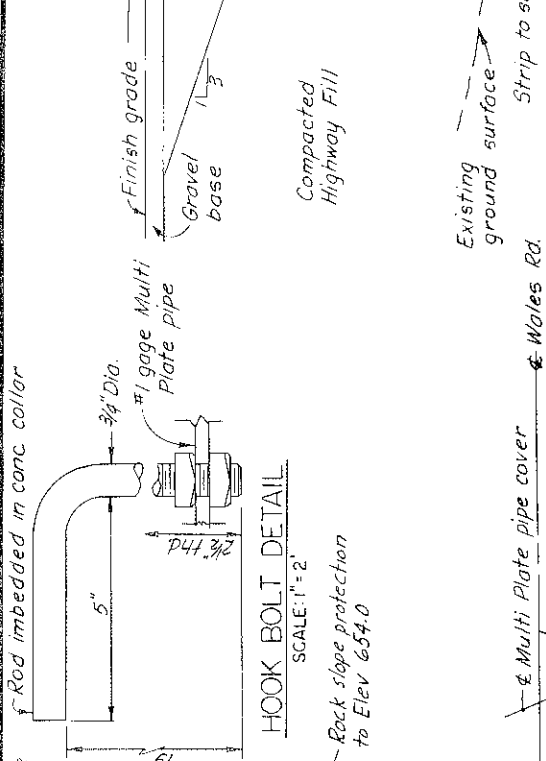
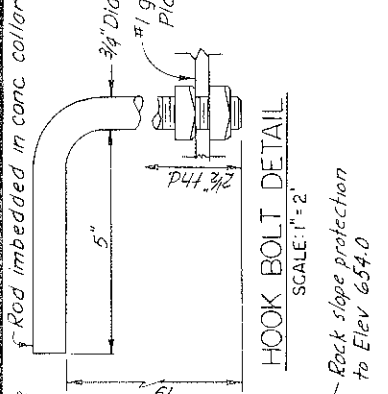
STA 60+5 R/L STA 69+00-33 R/L

SCALE 115
BPSV 115 DIA

CONSTANT PROXIMATE DWG. NO. 15
SHEET 15



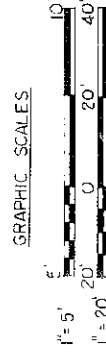
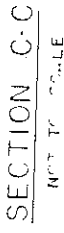
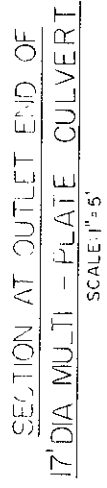
GRAPHIC SCALES



| REVISION | DATE | DESCRIPTION | BY |
|----------|------|-------------|----|
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U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WILTMAN, MASS.

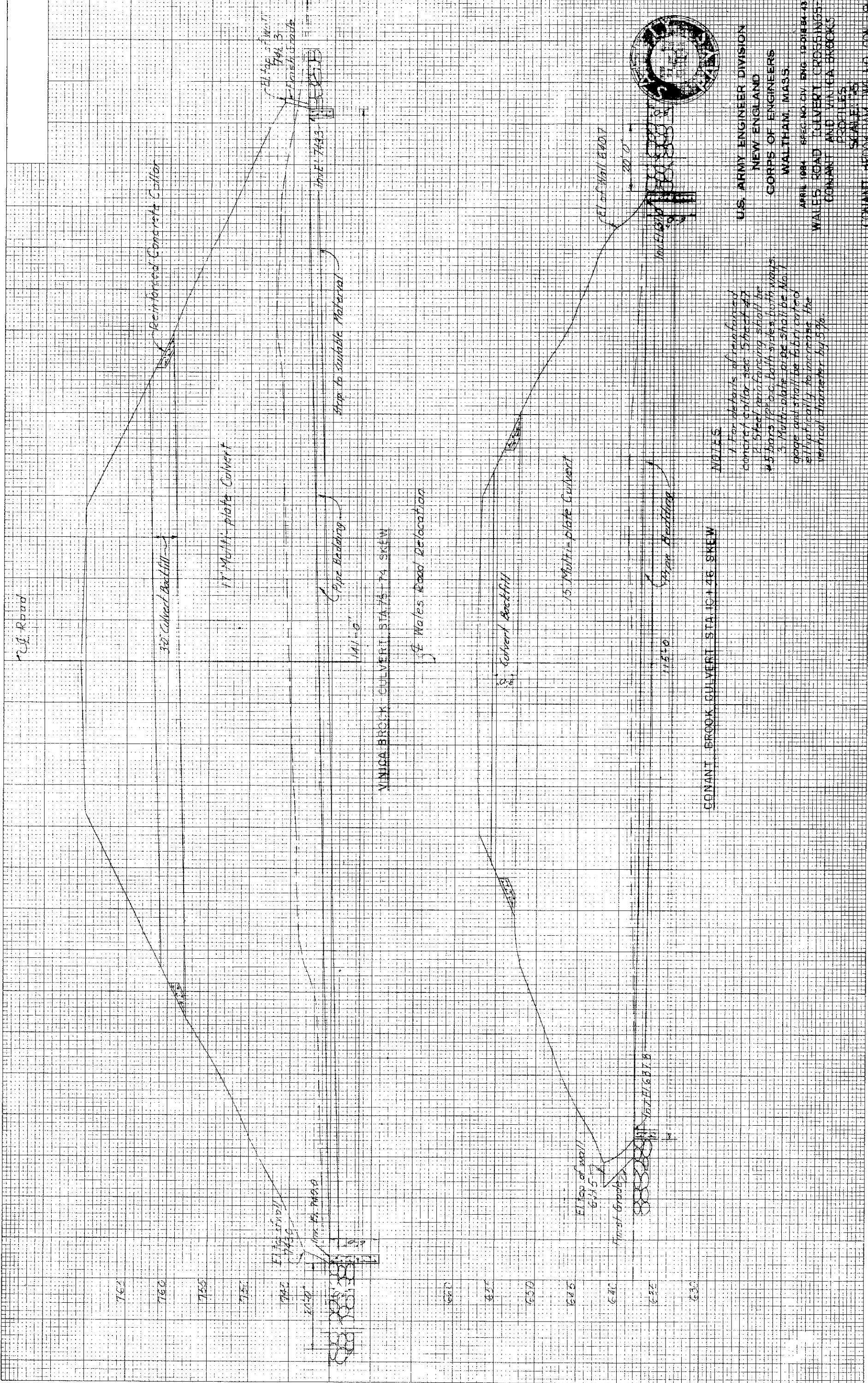
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|--|------------------|
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD | |
| CULVERT WALES ROAD CULVERT CROSSING - CONANT BROOK PLAN AND SECTIONS | |
| CHICOPEE RIVER MASSACHUSETTS | DATE: APRIL 1964 |
| APPROVED: <i>[Signature]</i> DRAWN: <i>[Signature]</i> | |
| SHEET 47 | |



Stones, in this area where the 3 ft. thickness is shown, shall not be less than $\frac{1}{2}$ cu. yd. in size.



| | | | |
|--|--|---|---|
| DES. BY H.M.L. | CHK. BY H.M.L. | CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD WALES ROAD CULVERT CROSSING - VINICA BROOK PLAN AND SECTIONS MASSACHUSETTS CHICOPEE RIVER | DATE APRIL 1964 |
| DRAWN D.L.W. | APPROVED <i>J. A. Rebec</i> | | SCALE AS SHOWN SPEC. NO. CIV. ENG. 19-016-64-43 |
| SUBMITTED | PROJECT ENGINEER <i>J. A. Rebec</i> | | DRAWING NUMBER CON - 9 |
| REVIEWED <i>J. A. Rebec</i> | APPROVAL RECOMMENDED <i>J. A. Rebec</i> | | SHEET 48 |
| REVISION | DATE | DESCRIPTION | BY |
| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | | | |



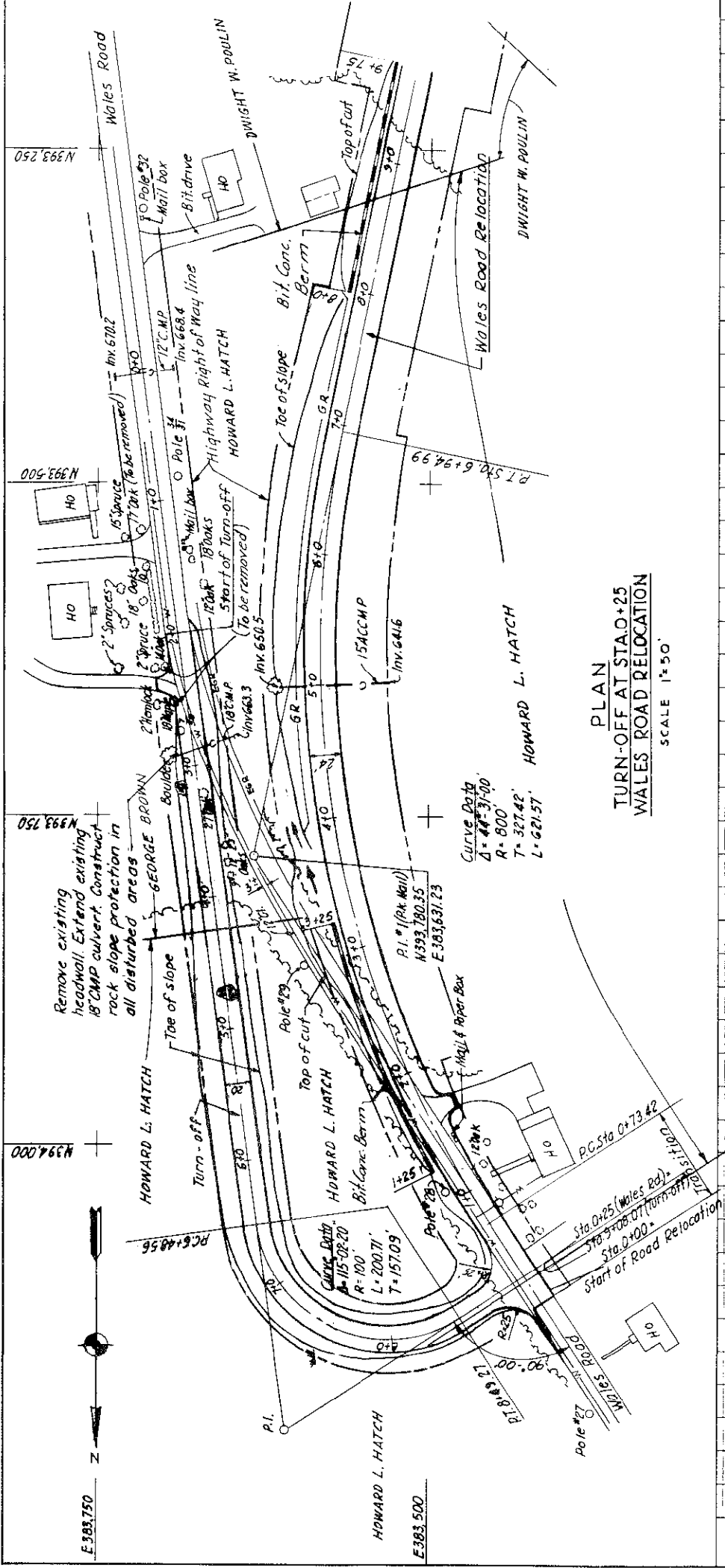
CONANT BROOK CULVERT STA 10+48 SKEW

NOTES

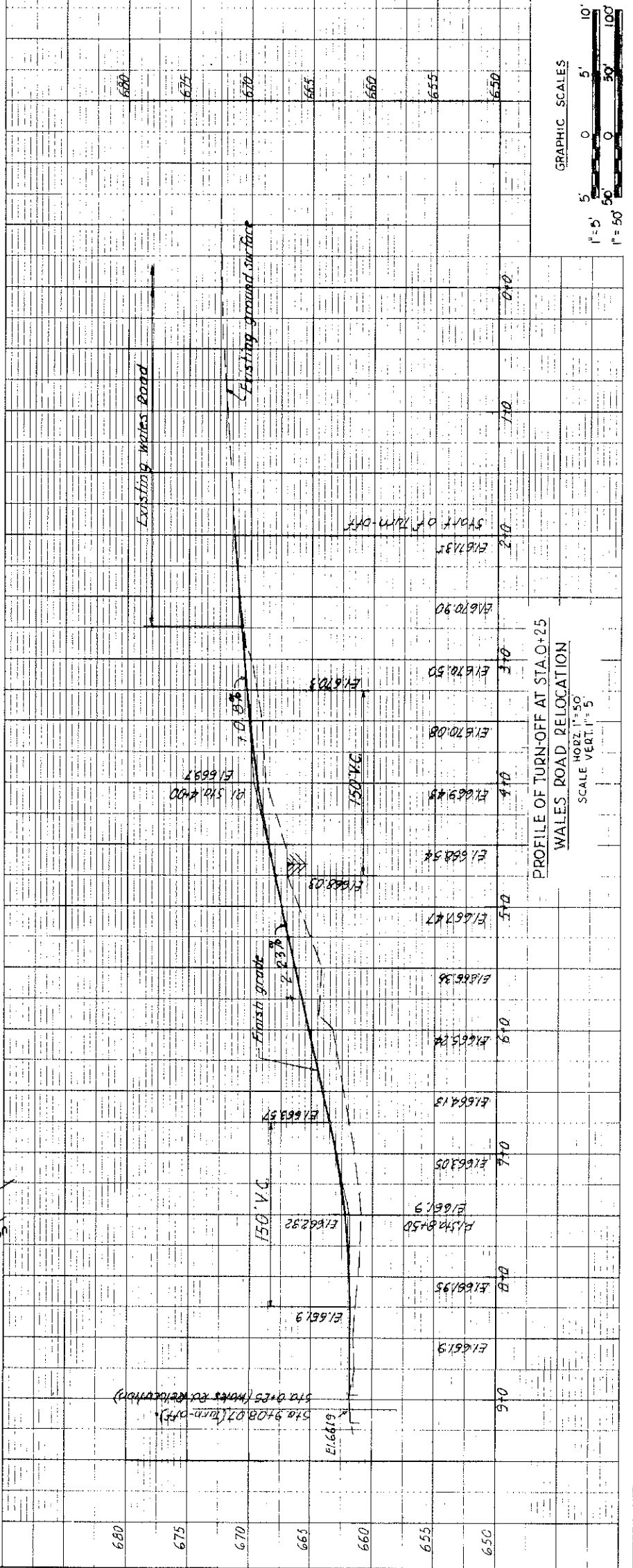
- 1. For details of reinforced concrete collar see 5 sheet of
- 2. Steel reinforcing shall be
- 3. Multi-plate pipe shall be No. 1
- 4. gage and shall be fabricated
- 5. vertically to increase the
- vertical diameter by 5%

U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC NO. CIV ENG 1001864-13
WALLES ROAD CULVERT CROSSINGS
CONANT AND VINICA BROOKS
PROFILES
SCALE 1"=25'

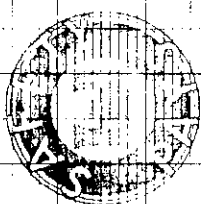
CONANT BROOK DAM DREDG. CON. 13



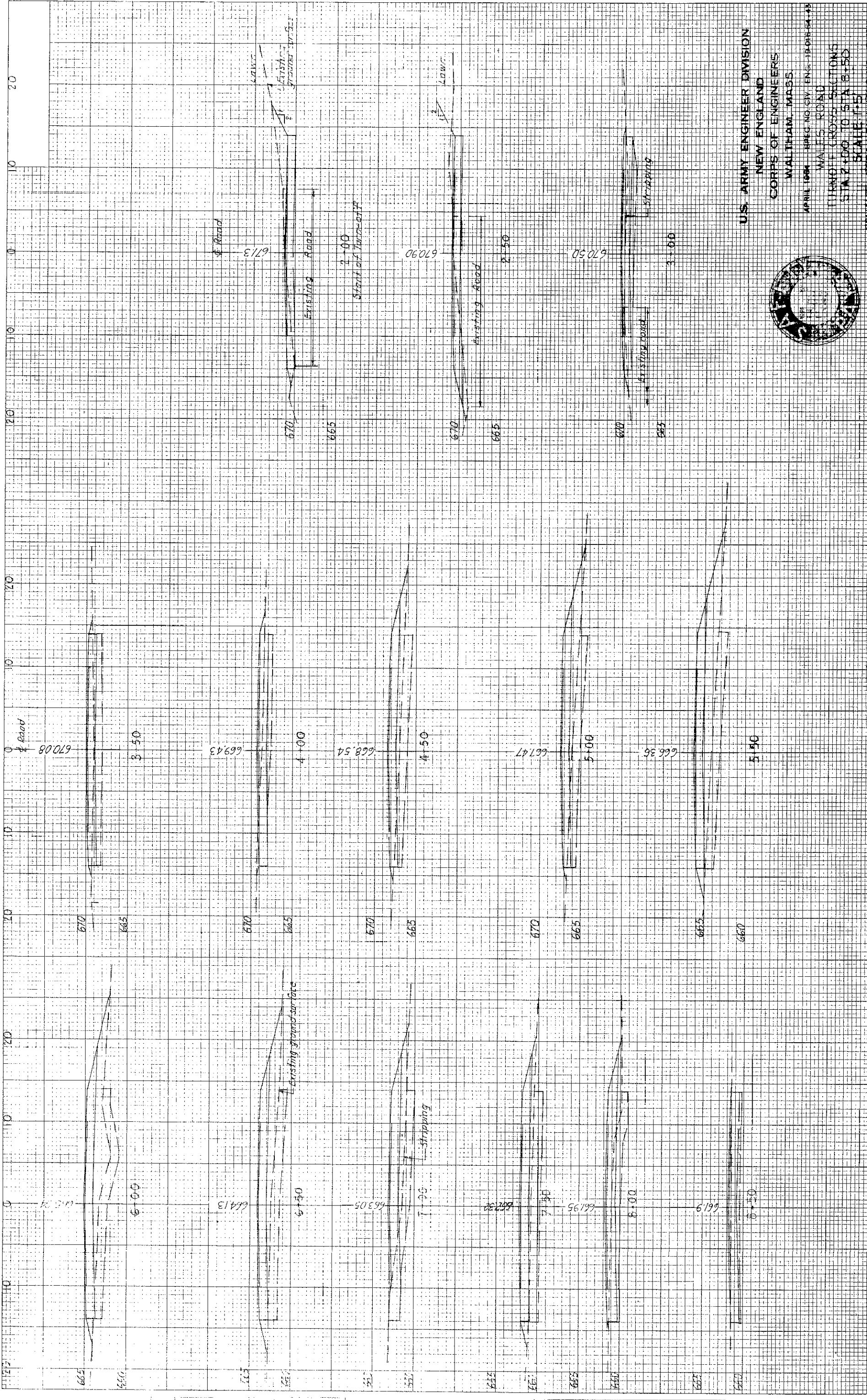
PLAN
TURN-OFF AT STA 0+25
WALES ROAD RELOCATION
SCALE 1"=50'

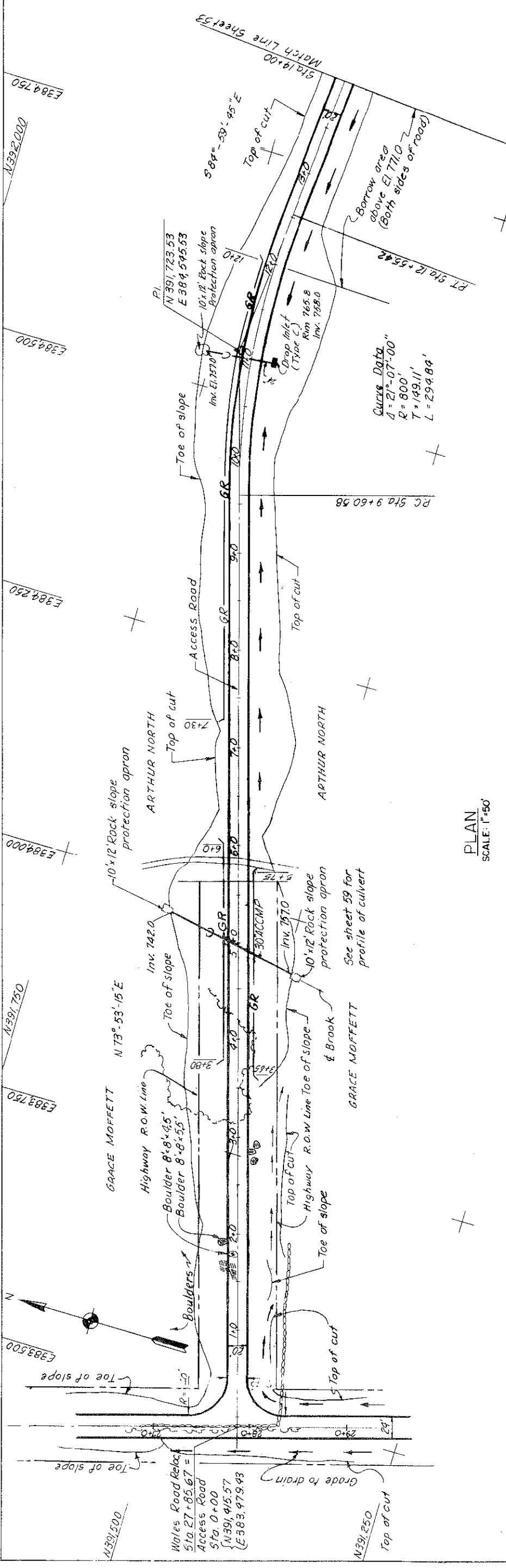


PROFILE OF TURN-OFF AT STA 0+25
WALES ROAD RELOCATION
SCALE HORIZ. 1"=50'
SCALE VERT. 1"=5'

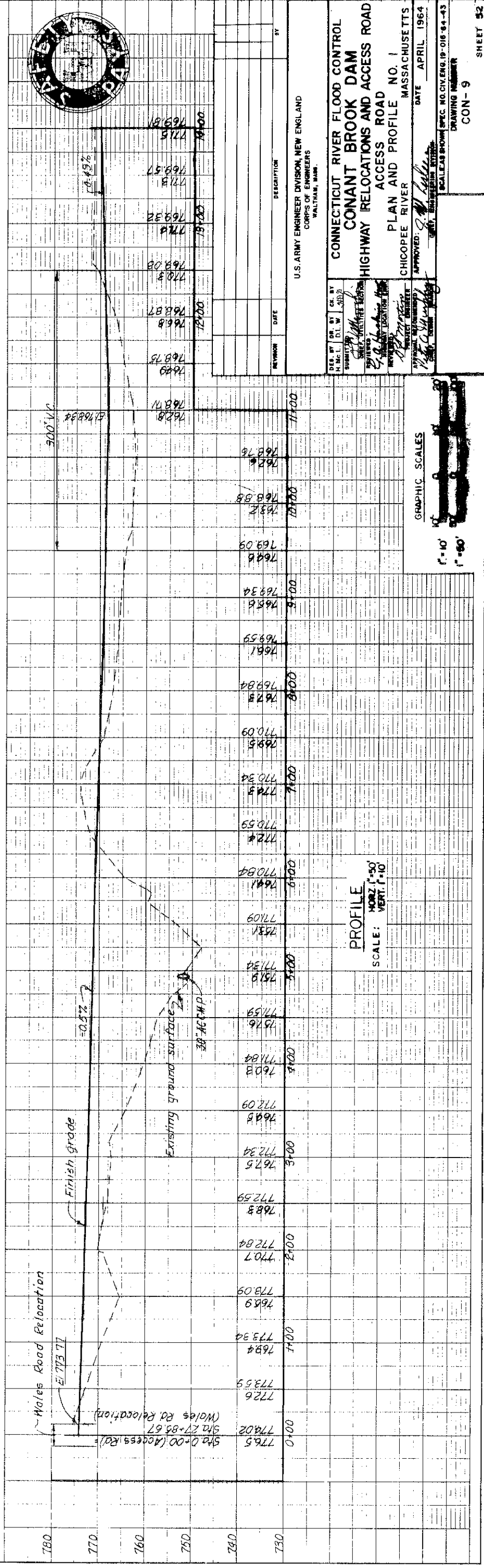


| | | | | | |
|---|--------|--------|------|-------------|----|
| DES. BY | DR. BY | CA. BY | DATE | DESCRIPTION | BY |
| W.M.C. | D.L.W. | W.M.C. | | | |
| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | | | | | |
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD WALES ROAD TURN-OFF - PLAN | | | | | |
| CHICOPEE RIVER MASSACHUSETTS | | | | | |
| APPROVED: <i>[Signature]</i> DATE: APRIL 1964 | | | | | |
| CHIEF ENGINEER DIVISION | | | | | |
| SCALES SHOWN SPEC. NO. CIV. ENG. 19-016-64-43 DRAWING NUMBER CON - 9 | | | | | |
| SHEET 50 | | | | | |

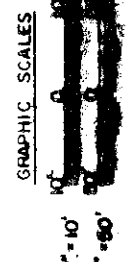




PLAN
SCALE: 1"=50'



PROFILE
SCALE: HORIZ. 1"=50'
VERT. 1"=10'



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

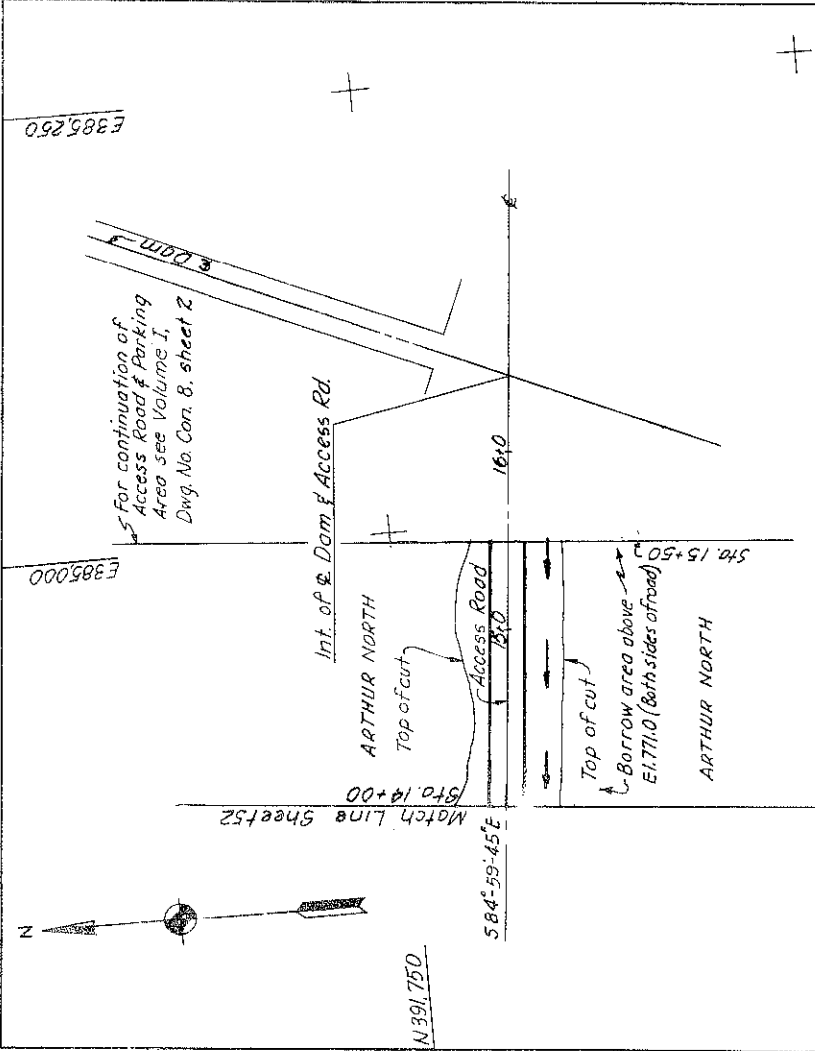
CONTRACT NO. 1
ACCESS ROAD
HIGHWAY RELOCATIONS AND ACCESS ROAD
PLAN AND PROFILE NO. 1
CHICOPEE RIVER
MASSACHUSETTS

APPROVED: *[Signature]*
DATE: APRIL 1964

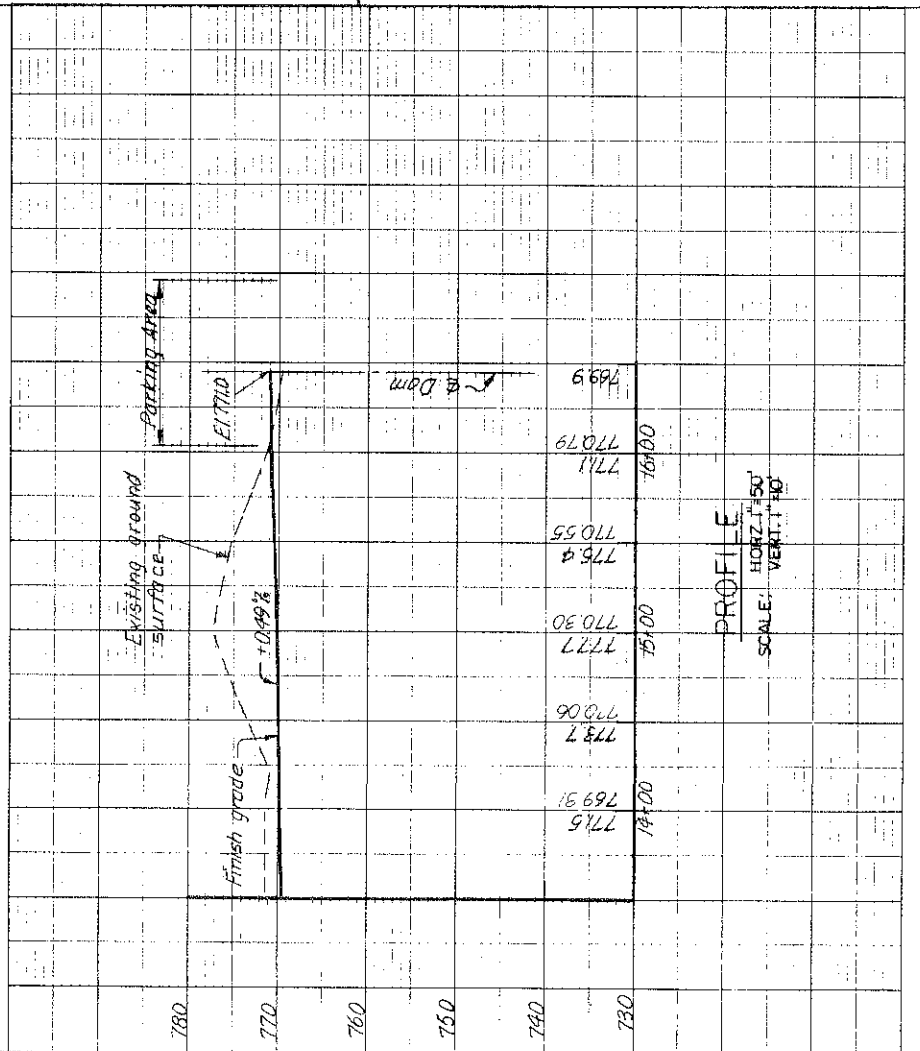
SCALE: HORIZ. 1"=50'
VERT. 1"=10'

DRAWING NUMBER
CON-9

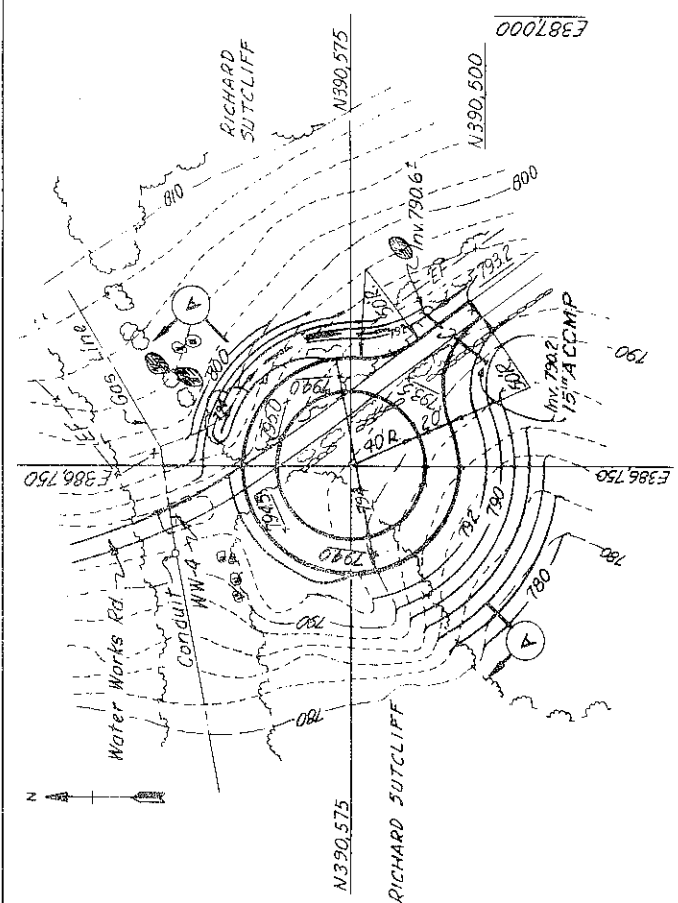
SHEET 52



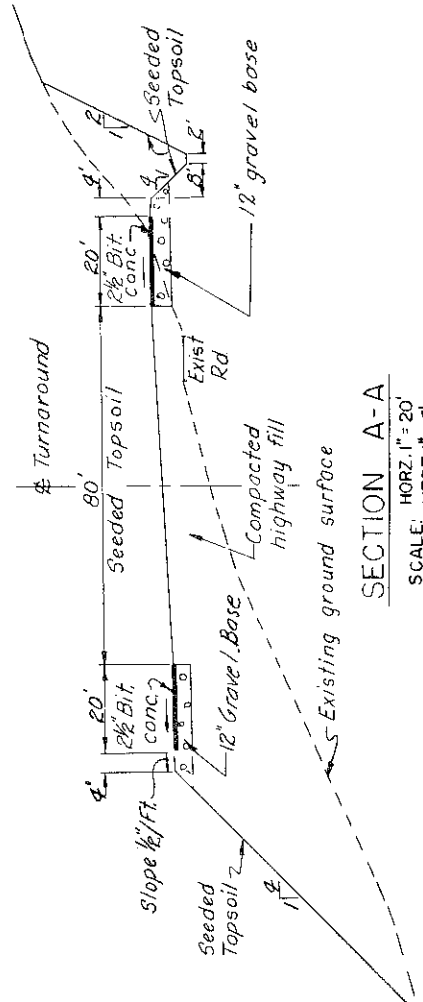
PLAN
SCALE: 1"=50'



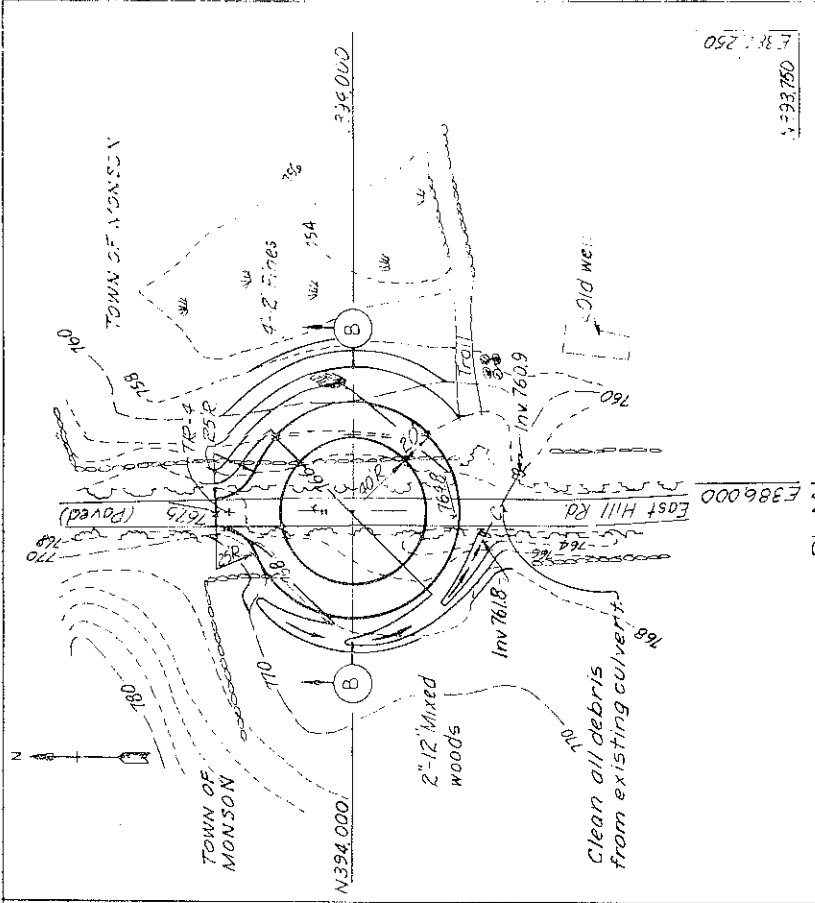
PROFILE
SCALE: 1"=50'



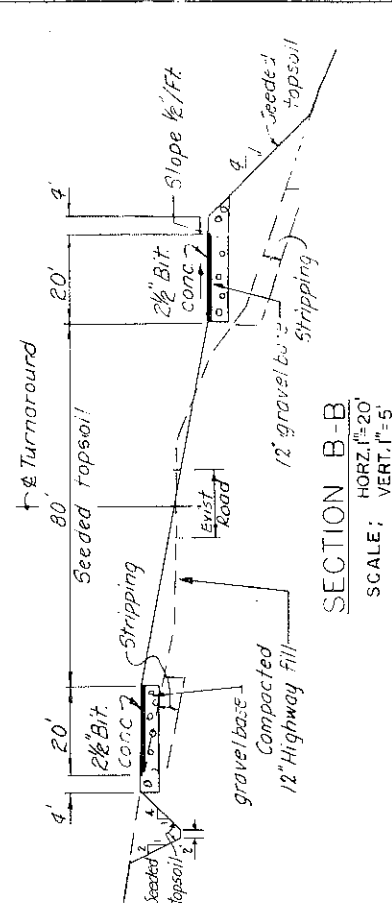
PLAN
WATER WORKS ROAD TURNAROUND
SCALE: 1"=50'



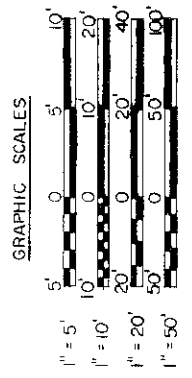
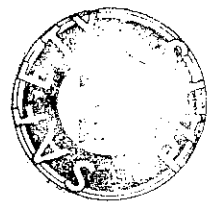
SECTION A-A
HORZ. 1"=20'
VERT. 1"=5'



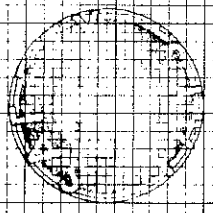
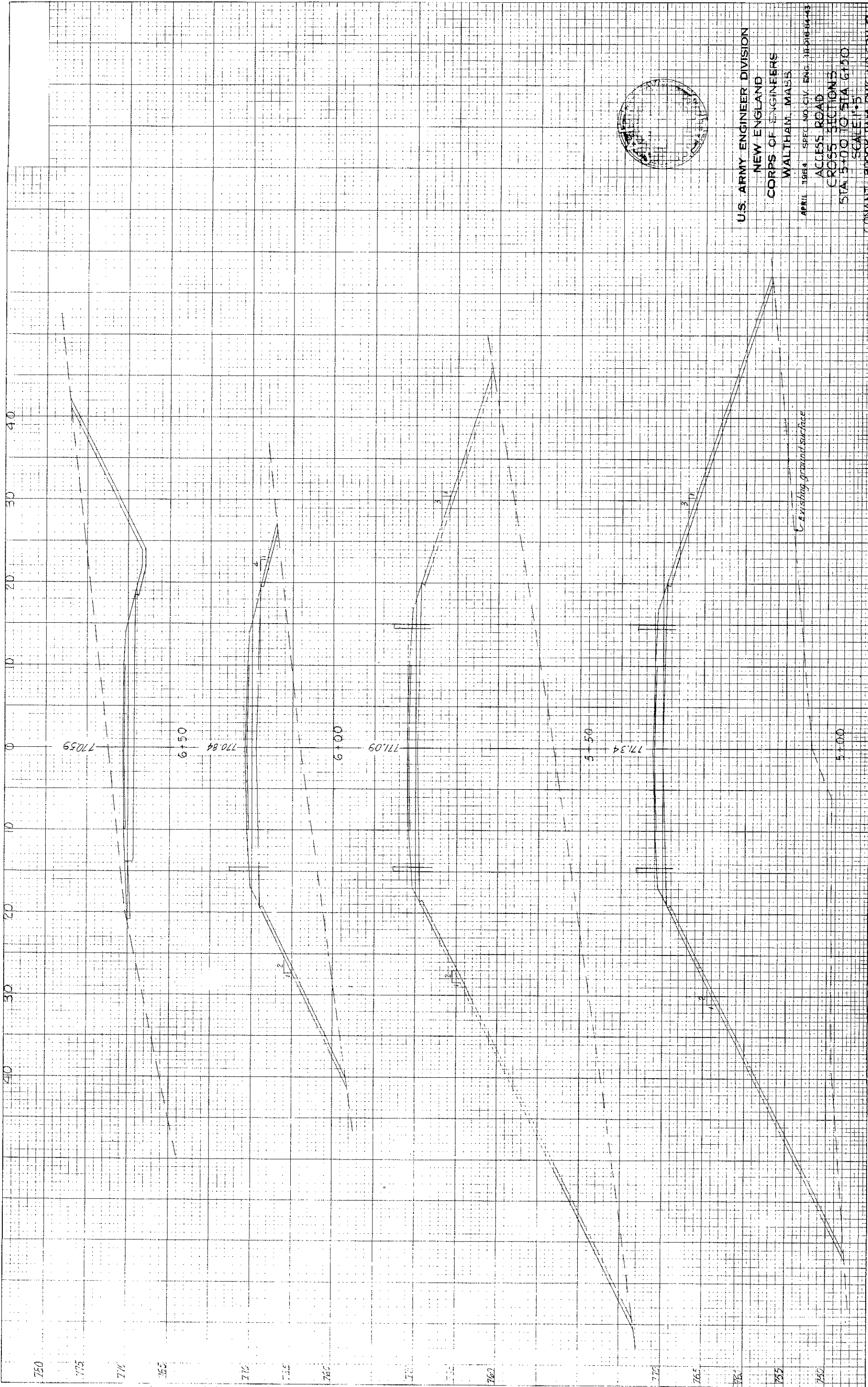
PLAN
EAST HILL ROAD TURNAROUND
SCALE: 1"=50'



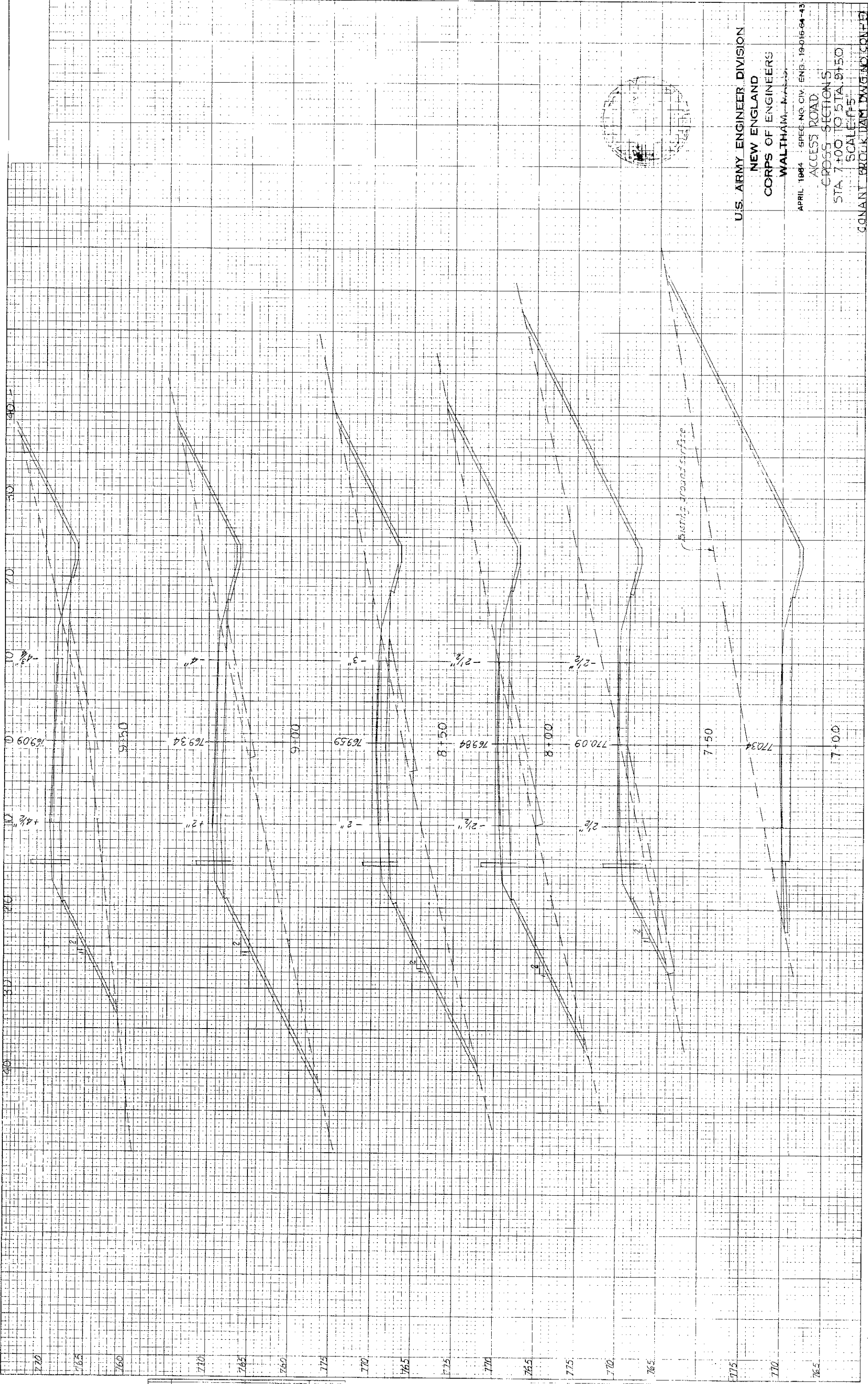
SECTION B-B
HORZ. 1"=20'
VERT. 1"=5'



| | |
|---|----------------------------------|
| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | |
| CONTRACT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD | |
| PLAN AND PROFILE NO. 2 TURNAROUNDS AND SECTIONS CHICOPEE RIVER MASSACHUSETTS | |
| DESIGNED BY H.M.C. D.L.W. J.54 | APPROVED DATE APRIL 1964 |
| CHECKED BY H.M.C. D.L.W. J.54 | CHECKED BY DATE APRIL 1964 |
| DRAWING NUMBER CON - 9 | |
| SHEET 53 | |



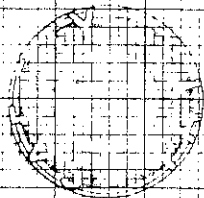
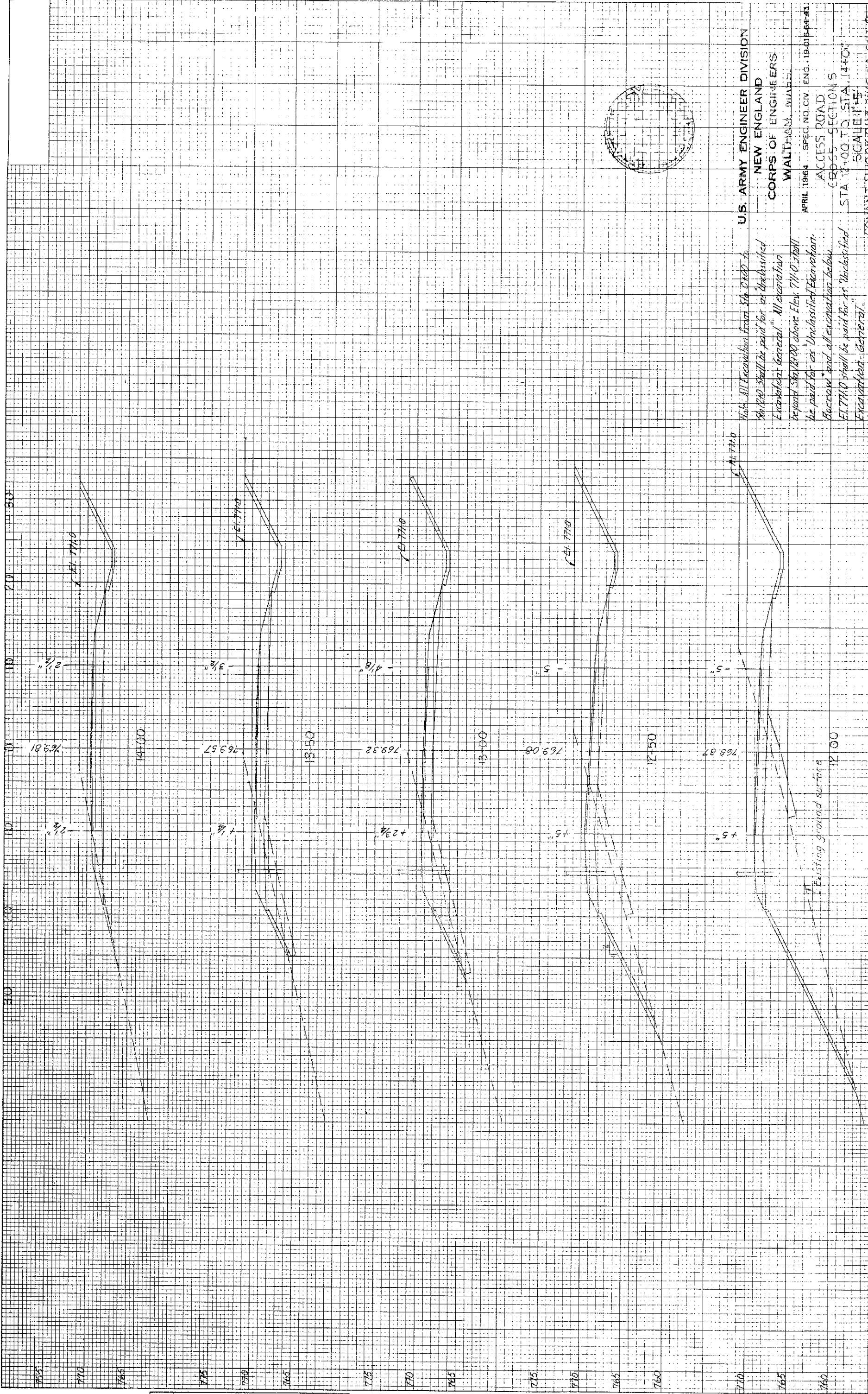
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. 18-016-B4-43
ACCESS ROAD
CROSS SECTIONS
STA. 5+00 TO STA. 6+00
SCALE 1"=5'
CONANT BOOK DAM DWG. NO. CON-13



| | |
|------|----|
| DATE | BY |
| | |

| | |
|---------------|----|
| DATE | BY |
| | |
| FINAL SURVEY | |
| NOTE BOOK | |
| AREAS CHECKED | |
| | |

U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. - 19-016-64-43
ACCESS ROAD
CROSS SECTIONS
STA. 7+00 TO STA. 7+50
SCALE: 1"=5'
CONANT BROOK DAM TWEED CO. N.Y.

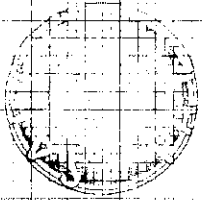
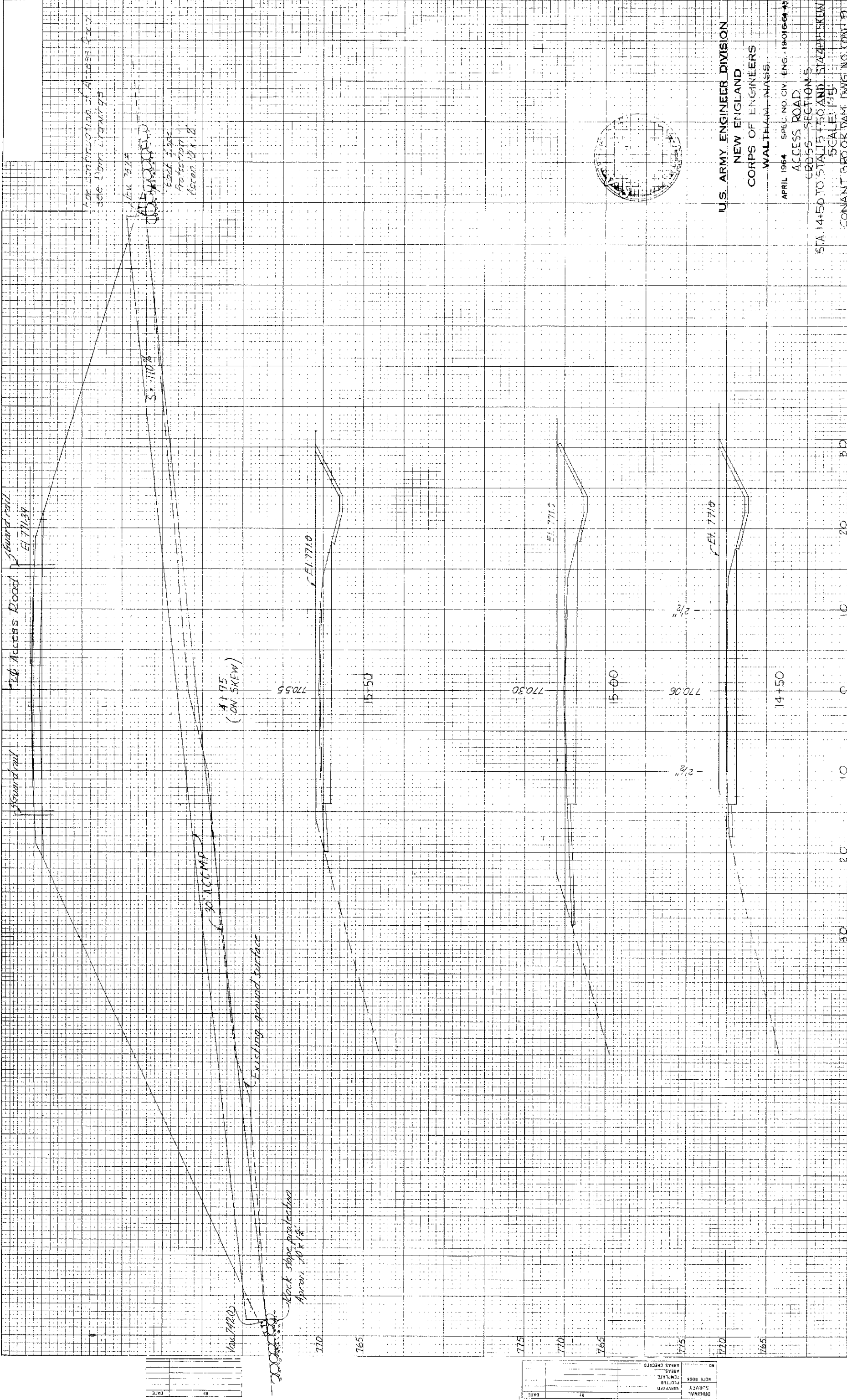


U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
APRIL 1964 SPEC. NO. CIV. ENG. 19-018-64-43
ACCESS ROAD
CROSS SECTION 5
STA 12+00 TO STA 14+00
SCALE 1"=5'
CONANT BROOK TAYLOR DWG NO. 001-9

Note: All Excavation from Sta 12+00 to Sta 14+00 shall be paid for as "Unclassified Excavation - General". All excavation beyond Sta 14+00 above Elev. 7710 shall be paid for as "Unclassified Excavation - Bottom" and all excavation below Elev. 7710 shall be paid for as "Unclassified Excavation - General".

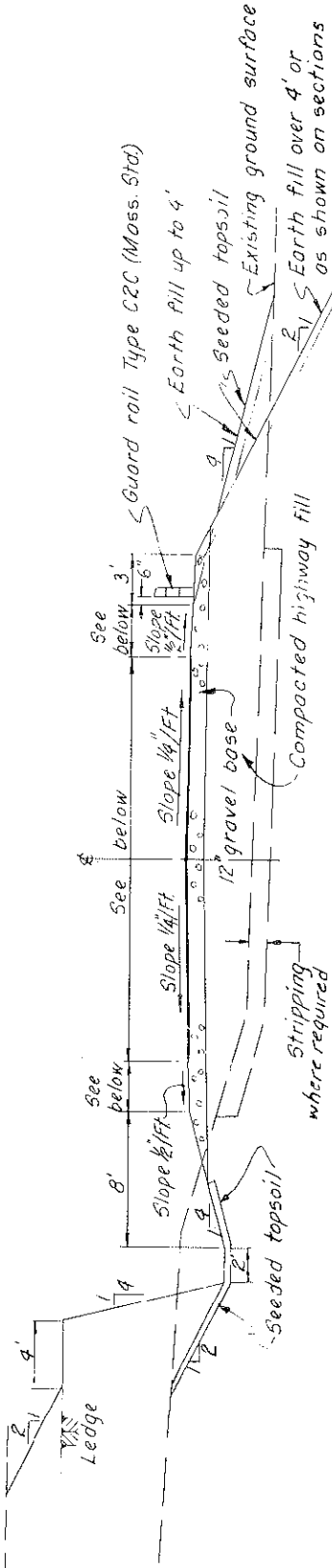
| | |
|---------------|------|
| NO. | DATE |
| BY | |
| ORIGINAL | |
| SURVEY | |
| NOTE BOOK | |
| AREAS CHECKED | |
| AREAS | |
| TEMPLATE | |
| PLOTTER | |
| SURVEY | |
| DATE | |

| | |
|---------------|------|
| NO. | DATE |
| BY | |
| ORIGINAL | |
| SURVEY | |
| NOTE BOOK | |
| AREAS CHECKED | |
| AREAS | |
| TEMPLATE | |
| PLOTTER | |
| SURVEY | |
| DATE | |



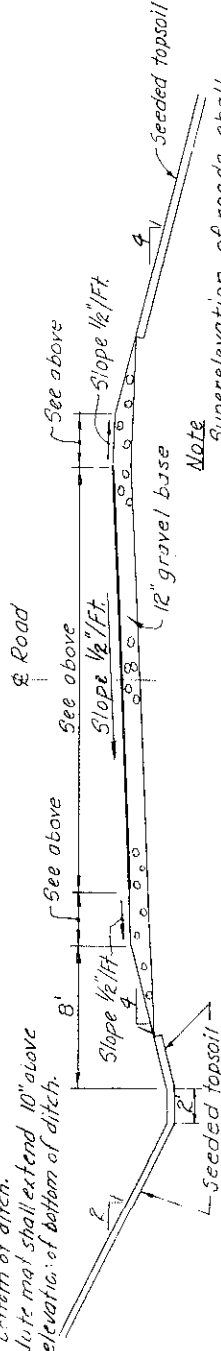
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1964 SPEC. NO. CIV. ENG. 18010-04-15
ACCESS ROAD
CR055 - SECTION 5
STA. 14+50 TO STA. 15+50 AND STAKE 5 SKW
SCALE: 1"=5'
CONANT BROOK DAM DWG. NO. CON-1-31



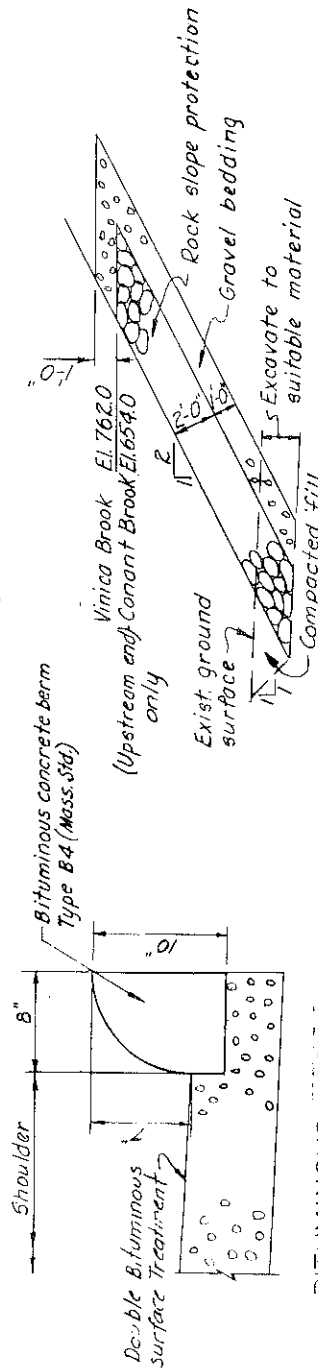
TYPICAL ROAD SECTION
SCALE: 1"=5'

Note: Ditch elevations shall be as determined from typical road sections except where specific elevations are indicated on the road cross section sheet. Bituminous concrete in paved ditches shall extend 1' above elevation of bottom of ditch. Jute mat shall extend 10" above elevation of bottom of ditch.



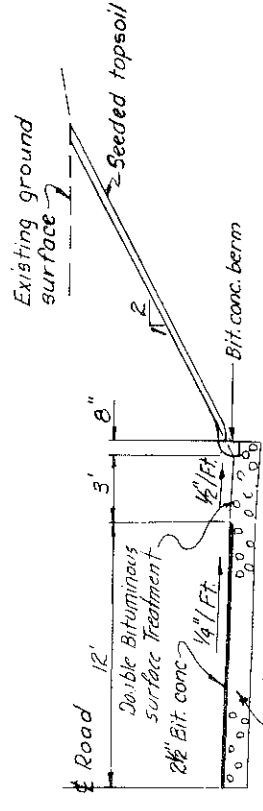
TYPICAL SUPERELEVATED ROAD SECTION
SCALE: 1"=5'

Note: Superelevation of roads shall start 150 feet before the PC and extend 150 feet beyond the PT of curves or as shown on sections.

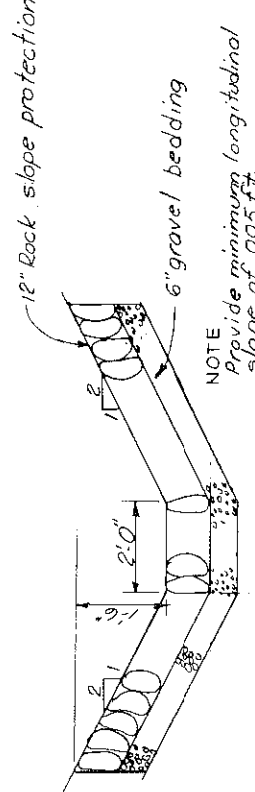


TYPICAL SECTION OF ROCK SLOPE PROTECTION AND GRAVEL BEDDING
NOT TO SCALE

Wales Road Relocation Left Sta. 77+35 to 79+75 } Vinica Brook
" " " Right Sta. 77+35 to 80+25 }
Left Sta. 9+80 to 11+50 } Canant Brook

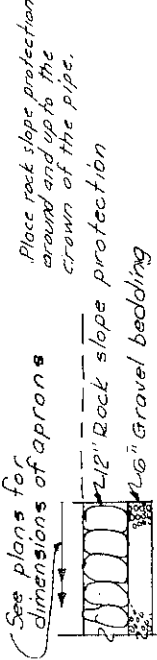


TYPICAL DETAIL AT BERM
NOT TO SCALE



TYPICAL DRAINAGE DITCH DETAILS
NOT TO SCALE

NOTE: Provide minimum longitudinal slope of .005 ft/ft.



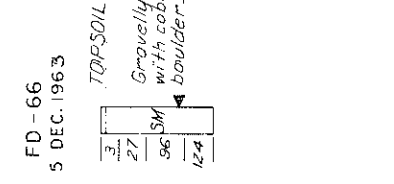
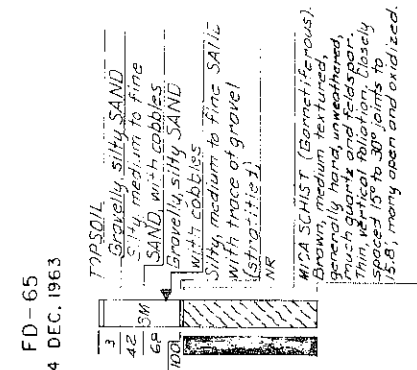
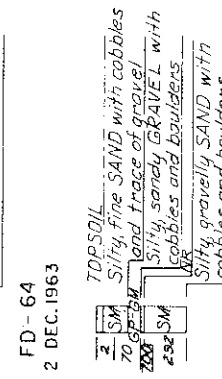
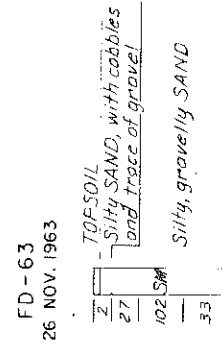
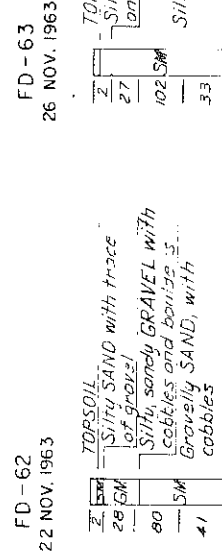
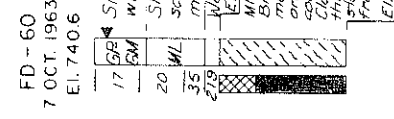
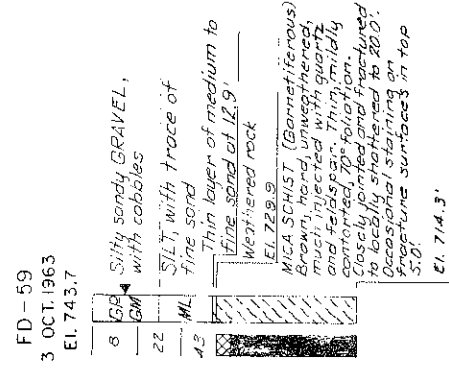
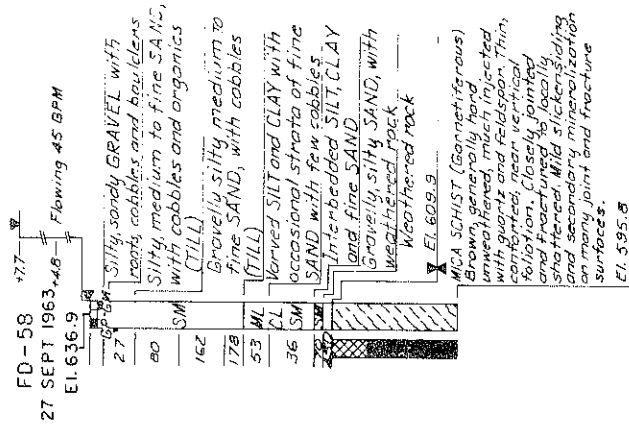
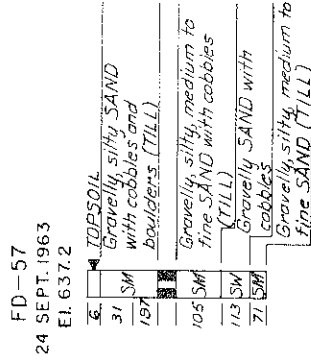
PARTIAL APRON SECTION
NOT TO SCALE

NOTES

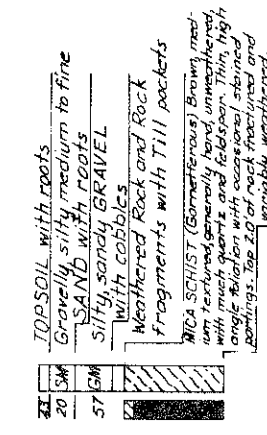
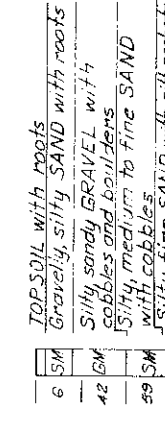
1. Construction of Turn-off at Sta 0+23, Wales Road Relocation, to be similar to that of the Access Road.
2. Construction work on Moulton Hill Road in the vicinity of Wales Road Relocation to be similar to that of Wales Road Relocation.



| | | | | | |
|--|--------|-------|------|-------------|----|
| DES BY | CHK BY | APP'D | DATE | DESCRIPTION | BY |
| HAMEL, D.L.W. | 9/1/64 | | | | |
| U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. | | | | | |
| CONNECTICUT RIVER FLOOD CONTROL CONANT BROOK DAM HIGHWAY RELOCATIONS AND ACCESS ROAD TYPICAL ROAD SECTIONS CHICOPEE RIVER MASSACHUSETTS | | | | | |
| APPROVED: <i>[Signature]</i> DATE: APRIL 1964 | | | | | |
| SCALE: AS SHOWN SPEC. NO. CIV. ENG. 1016-64-43 DRAWING NUMBER CON - 9 SHEET 60 | | | | | |



| | | |
|----|----|--|
| 18 | GP | Sandy GRAVEL with cobbles and boulders |
| 30 | SP | Silty, gravelly SAND with cobbles |
| 40 | ML | Fine, sandy SILT with sand pockets |



NOTES

[illegible]

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
MAIL STOP 1000, NEWTON, MASS 02459

CONNECTICUT RIVER FLOOD CONTROL
CONANT BROOK DAM
HIGHWAY RELOCATIONS AND ACCESS ROAD
FOUNDATION EXPLORATIONS NO. 1
CHICOPEE RIVER MASSACHUSETTS

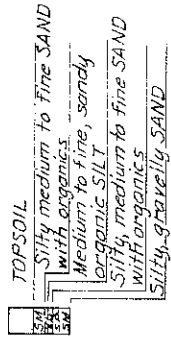
APPROVED S. W. Foster DATE APRIL 1964

DRAWING NUMBER
 SPEC. NO. CIV. ENG. 19-016-64-43

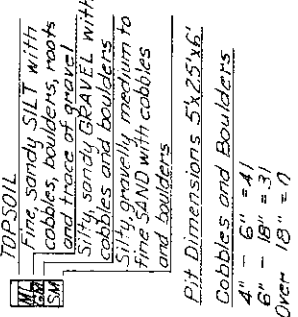
FA-1
30 SEPT. 1963
EL. 646 ±



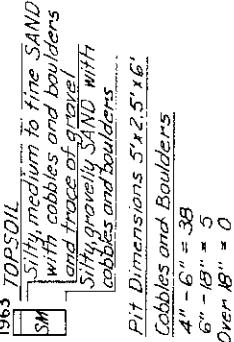
FA-2
6 DEC. 1963



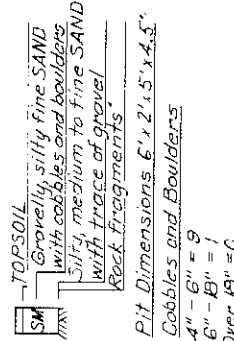
FT-4
21 NOV. 1963



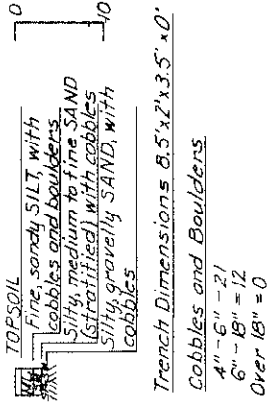
FT-5
21 NOV. 1963



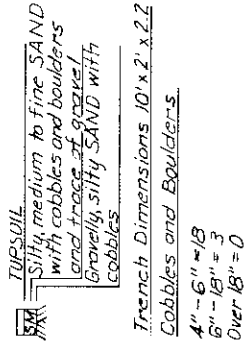
FT-6
6 DEC. 1963



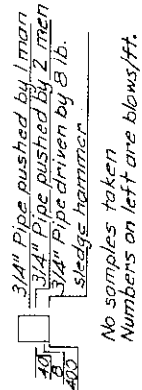
FTT-3
27 NOV. 1963



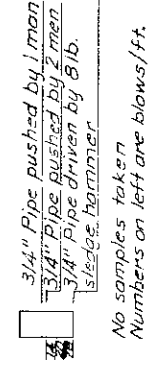
FTT-4
27 NOV. 1963



FP-1
6 DEC. 1963



FP-2
6 DEC. 1963



| | |
|-----------|--|
| SM | Group letter symbol according to Unified Soil Classification System. |
| NR | No recovery or unsatisfactory soils samples recovered. |
| NS | Not sampled. Hole advanced by core-drilling, blasting and/or wash boring due to operational difficulty. |
| | Blows per foot of penetration considered most representative for each sample drive using a 360 pound hammer with a free fall of about 18" on a standard 5 foot, solid sample spoon with a beveled, sharpened drive shoe. |
| | Cobble or boulder (Core drilled) |
| | Cobbles or boulders, continuous or nested (Core drilled and/or blasted and chopped) |
| EL. 614.1 | Elevation of bedrock surface |
| | Rock symbol |
| | Rock Core Recovery 0 - 25% |
| | Rock Core Recovery 25 - 50% |
| | Rock Core Recovery 50 - 75% |
| | Rock Core Recovery 75 - 90% |
| | Rock Core Recovery 90 - 100% |

EXPLORATION NOTES

Water levels recorded during subsurface explorations seldom correspond with the natural level of free ground water except in extensive and thick deposits of sands and gravels which are sufficiently pervious to permit rapid stabilization of water levels in the exploratory hole. Absence of subsurface water in the graphic log of any exploration is not necessarily to be construed that ground water will not be encountered in excavation at that location.

While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of the overburden and rocks of this region are anticipated, and if encountered such variations will not be considered as differing "Materially" from represented conditions within the purview of Article 4 of the Contract.

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

| | | |
|--------------------|--------|-------|
| DES. BY | DR. BY | C. BY |
| SUBMITTED | FILED | |
| PROJECT NUMBER | | |
| APPROVAL | | |
| CHIEF OF ENGINEERS | | |
| DATE | | |

| | |
|-------------------------------------|---------------|
| CONNECTICUT RIVER FLOOD CONTROL | |
| CONANT BROOK DAM | |
| HIGHWAY RELOCATIONS AND ACCESS ROAD | |
| FOUNDATION EXPLORATIONS NO. 2 | |
| CHICOPEE RIVER | MASSACHUSETTS |
| APPROVED | DATE |
| 10/1/63 | APRIL 1964 |

SCALE: AS SHOWN SPEC. NO. CIV. ENG. 19-016-64. 43
DRAWING NUMBER
CON - 9

SERIAL NO. CIV. ENG.-19-016-64-43

CONNECTICUT RIVER FLOOD CONTROL PROJECT

CONANT BROOK DAM

CHICOPEE RIVER, MASSACHUSETTS

SPECIFICATIONS

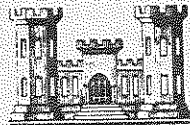
FOR THE

CONSTRUCTION OF DAM,
HIGHWAY RELOCATIONS

AND

APPURTENANT STRUCTURES

*Approved:
V-14-64*



U.S. Army Engineer Division, New England
Corps of Engineers
Waltham, Mass.

APRIL 1964

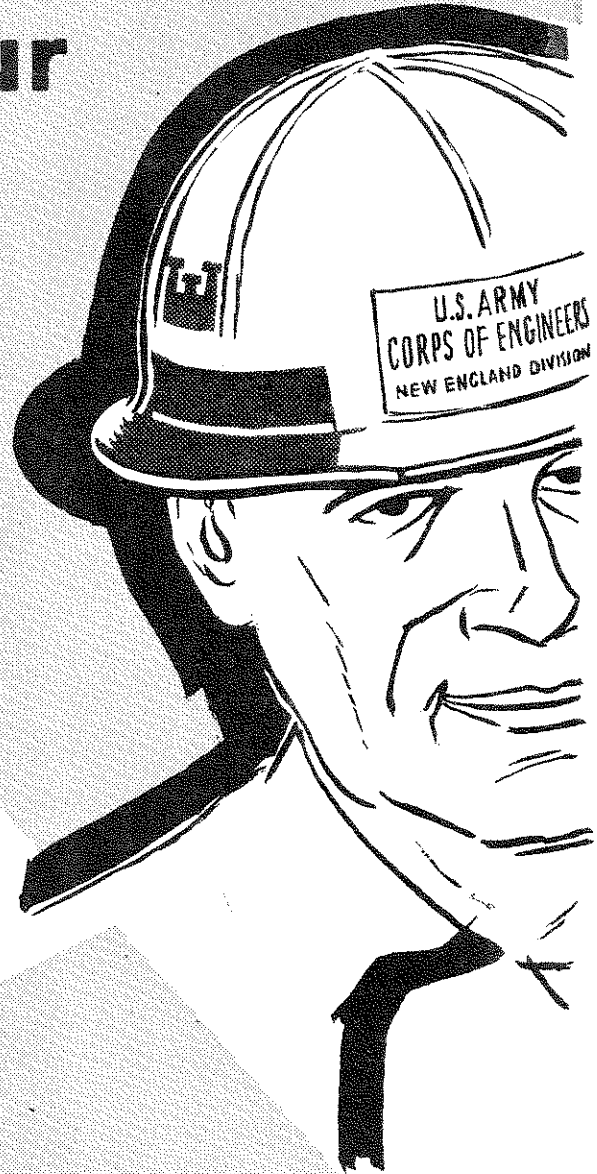
NED

NEW ENGLAND DIVISION

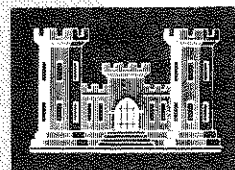


**Wear Your
HARD
HAT**

*"a
little care
makes
mishaps rare"*



**The Head You Save
WILL BE
YOUR OWN**



U.S. ARMY CORPS OF ENGINEERS

Serial No. CIVENG-19-016-64-43

CONNECTICUT RIVER FLOOD CONTROL PROJECT

SPECIFICATIONS
FOR
CONSTRUCTION
OF
CONANT BROOK DAM
HIGHWAY RELOCATIONS
AND
APPURTENANT STRUCTURES
MONSON, MASSACHUSETTS

2 APRIL 1964

THESE FACILITIES WERE DESIGNED BY NED

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS

WALTHAM, MASSACHUSETTS

TABLE OF CONTENTS

INVITATION FOR BIDS

PART I - GENERAL CONDITIONS
PART II - SPECIAL CONDITIONS
PART III - TECHNICAL PROVISIONS

| <u>Section No.</u> | <u>Title</u> |
|--------------------|---|
| 1 | PREPARATION OF SITE |
| 2 | CONTROL AND DIVERSION OF WATER |
| 3 | EXCAVATION |
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INVITATION FOR BIDS
(CONSTRUCTION CONTRACT)

Serial No. CIVENG-19-016-64-43

DATE

2 April 1964

NAME AND LOCATION OF PROJECT

DEPARTMENT OR AGENCY

CONSTRUCTION OF CONANT BROOK DAM, HIGH-
WAY RELOCATIONS, AND APPURTENANT
STRUCTURES, MONSON, MASSACHUSETTS

Department of the Army
Corps of Engineers

BY (Issuing office)

Division Engineer
U.S. Army Engineer Division, New England
424 Trapelo Road
Waltham, Mass. 02154

Scaled bids in duplicate for the work described herein will be received until 2:00 p.m., E.D.S.T., 7 May 1964, at the address of the Division Engineer, U.S. Army Engineer Division, New England, 424 Trapelo Road, Waltham, Mass. and at that time publicly opened.

Information regarding bidding material, bid guarantee, and bonds

1. Bids may be mailed to: The Division Engineer, U.S. Army Engineer Division, New England, 424 Trapelo Road, Waltham, Mass. 02154

2. In lieu of mailing, bids may be delivered in advance to: The Bids Receiving Desk, Building 109S at the above address. Just prior to the bid opening, bids may be delivered directly to the Contracting Officer in Building 126 (Theater).

3. Bids will be opened at: Building 126 (Theater), 424 Trapelo Road, Waltham, Mass.

4. Bids shall be submitted on Standard Form 21 (Bid Form - Construction Contract) and shall be prepared in accordance with Standard Form 22 (Instructions to Bidders). The bidder who is awarded the contract will be required to execute the standard contract form for construction contracts (Standard Form 23) attached hereto with Standard Form 23A, General Provisions, and supplement thereto, which set forth the contract clauses.

5. Bid guarantee hereinafter specified in a penal sum of 20% of the bid price or \$3,000,000, whichever is the lesser, will be required if the bid price is in excess of \$2,000. If the guarantee is submitted in the form of a bid bond, Standard Form 24 will be used and the bid bond penalty may be expressed in terms of a percentage of the bid price or may be expressed in dollars and cents.

Description of Work - The work consists of furnishing all plant, labor, materials, and equipment and performing all work in strict accordance with the specifications, drawings and schedules for the construction of dam, dike, highway relocations and appurtenant structures for Conant Brook Dam and Reservoir, as follows:

Specifications entitled: "CONSTRUCTION OF CONANT BROOK DAM, HIGHWAY RELOCATIONS, AND APPURTENANT STRUCTURES, MONSON, MASSACHUSETTS."

Drawings as listed in Paragraph SC-3 of the specifications.

Schedules as set forth in the Bid Form.

BIDS MUST SET FORTH FULL, ACCURATE, AND COMPLETE INFORMATION AS REQUIRED BY THIS INVITATION FOR BIDS, INCLUDING ATTACHMENTS. THE PENALTY FOR MAKING FALSE STATEMENTS IN BIDS IS PRESCRIBED IN 18 U.S.C. 1001.

ICB

READ THE FOLLOWING IN CONJUNCTION
WITH INSTRUCTIONS TO BIDDERS
(U. S. STANDARD FORM 22)

SUPPLEMENT TO INVITATION FOR BIDS
(Construction Contract)

1. Each bidder shall, upon request of the Contracting Officer, furnish a list of the plant available to the bidder and proposed for use on the work.

2. Bidders are required to acknowledge receipt of all amendments to this invitation on the Bid Form (Standard Form 21) in the space provided, or by separate letter or telegram prior to opening of bids. Failure to acknowledge all amendments may cause the bid to be considered not responsive to the invitation, which would require rejection of the bid.

3. If the bidder, by checking the appropriate box provided therefor in this bid, has represented that he has employed or retained a company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure his contract, he may be requested by the Contracting Officer to furnish a completed Standard Form 119, "Contractor's Statement of Contingent or Other Fees for Soliciting or Securing Contract". If the bidder has previously furnished a completed Standard Form 119 to the office issuing this Invitation for Bids, he may accompany his bid with a signed statement, (a) indicating when such completed form was previously furnished, (b) identifying by number the previous invitation for bids or contract, if any, in connection with which such form was submitted, and (c) representing that the statements in such previously furnished form are applicable to this bid.

4. Modifications Prior to Date Set for Opening Bids. - The right is reserved, as the interest of the Government may require, to revise or amend the specifications and/or drawings prior to the date set for opening bids. Such revisions and amendments, if any, will be announced by an amendment or amendments to this Invitation for Bids. Copies of such amendments as may be issued will be furnished to all prospective bidders. If the revisions and amendments are of a nature which require material changes in quantities or prices bid or both, the date set for opening bids may be postponed by such number of days as in the opinion of the Division Engineer will enable bidders to revise their bids. In such cases, the amendment will include an announcement of the new date for opening bids.

5. The Government further reserves the right to make award on any or all schedules of any bid, unless the bidder qualifies such bid by specific limitation; also to make award to the bidder whose aggregate bid on any combination of bid schedules is low. For the purpose of this Invitation for Bids, the word "item", as used in paragraph 10(c) of Standard Form 22, shall be considered to mean "schedule".

6. Repeal of Federal Transportation Tax on Property. - Section 4, Tax Rate Extension Act of 1958, (Act 30 June 1958, Public Law 85-475), in Part repealed the Federal excise tax on the transportation of property effective with respect to amounts paid for such transportation on and after August 1958.

READ THE FOLLOWING IN CONJUNCTION
WITH INSTRUCTIONS TO BIDDERS
(U. S. STANDARD FORM 22)

SUPPLEMENT TO INVITATION FOR BIDS
(Construction Contract)

Accordingly, any bid price(s) submitted hereunder which include freight charges should exclude any amount(s) for Federal excise tax on the transportation of property.

Wherein these instructions conflict with Clause 35 "Federal, State and Local Taxes", of the Supplement to General Provisions (Construction Contracts) S.F. 23A, April 1961 Edition, these instructions will govern.

7. Notice Regarding Buy American Act (Sep. 1962). - a. The Department of Defense has changed its Buy American Act rules. Generally speaking, exception from the Buy American Act will be permitted only in the case of nonavailability of domestic construction materials. A bid or proposal offering nondomestic construction material will not be accepted unless specifically approved by the Office of the Secretary of Defense.

b. Where it is proposed to furnish nondomestic construction material, bids or proposals shall set forth an itemization of the quantity, unit price, and intended use of each item of such nondomestic construction material. When offering nondomestic construction material pursuant to this paragraph, bids or proposals may also offer, at stated prices, any available comparable domestic construction material, so as to avoid the possibility that failure of a nondomestic construction material to be acceptable under this paragraph will cause rejection of the entire bid.

8. Affiliated Bidders. - a. Business concerns are affiliates of each other when either directly or indirectly (i) one concern controls or has the power to control the other, or (ii) a third party controls or has the power to control both.

b. Each bidders shall submit upon request of the Government an affidavit containing information as follows:

- (i) whether the bidder has any affiliates;
- (ii) the names and addresses of all affiliates of the bidder; and
- (iii) the names and addresses of all persons and concerns exercising control or ownership of the bidder and any or all of his affiliates, and whether as common officers, directors, stockholders holding controlling interest, or otherwise.

Failure to furnish such an affidavit promptly upon request may result in rejection of the bid.

READ THE FOLLOWING IN CONJUNCTION
WITH INSTRUCTIONS TO BIDDERS
(U. S. STANDARD FORM 22)

SUPPLEMENT TO INVITATION FOR BIDS
(Construction Contract)

9. Parent Company Statement. - Bidders must execute the statement attached to and forming a part of the Bid Form furnishing information as to Parent Company and Employer Identification Number and submit one executed copy with the bid if the amount of the bid exceeds \$10,000. This requirement is in addition to the information required under the provisions of the Affiliated Bidders clause above.

10. Notice of Total Small Business Set-Aside (Nov. 1963).

a. Restriction. - Bids or proposals under this procurement are solicited from small business concerns only and this procurement is to be awarded only to one or more small business concerns. This action is based on a determination by the Contracting Officer, alone or in conjunction with a representative of the Small Business Administration, that it is in the interest of maintaining or mobilizing the Nation's full productive capacity, in the interest of war or national defense programs, or in the interest of assuring that a fair proportion of Government procurement is placed with small business concerns. Bids or proposals received from firms which are small business concerns shall be considered nonresponsive and shall be rejected.

b. Definition. - A "small business concern" is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operation in which it is bidding on Government contracts, and can further qualify under the criteria set forth in regulations of the Small Business Administration (Code of Federal Regulations, Title 13, Section 121.3-8). For construction, alteration, or repair (including painting and decorating), of buildings, bridges, roads, or other real property, the average annual receipts of the concern and its affiliates for its preceding three fiscal years must not exceed \$7,500,000, except that if the concern is located in Alaska, such receipts must not exceed \$9,375,000. For dredging, the average annual receipts of the concern and its affiliates for its preceding three fiscal years must not exceed \$5,000,000, except that if the concern is located in Alaska, such receipts must not exceed \$6,250,000.

READ THE FOLLOWING IN CONJUNCTION
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SUPPLEMENT TO INVITATION FOR BIDS
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11. Sets of drawings, full size or reduced size, and specifications will be furnished upon receipt of payment of \$10.00 per set. If individual plan sheets are requested, they will be furnished at the rate of \$0.10 for reduced size and \$0.50 for full size for each sheet requested, but with a minimum charge of \$1.00 except as provided for below. No refund of the payment for drawings will be made and the drawings need not be returned to the Division Engineer. Additional copies of the specifications alone will be furnished an applicant at the rate of \$1.00 per copy. Payments will be made by cash, check, or money order and delivered to the Finance and Accounting Officer, Corps of Engineers, Department of the Army, 424 Trapelo Road, Waltham, Mass. 02154. Checks and money orders should be made payable to "Treasurer of the United States". If the project is cancelled or no award is made under the invitation, upon request, refund of the payment for the plans and specifications will be made thereon upon return thereof to the issuing office, all charges prepaid.

12. Technical inquiries regarding the plans and specifications during the bidding period shall be made to the following:

Mr. Francis M. Griffin, Waltham, Mass., Twinbrook 4-2400, Ext. 288.

13. The value of work involved is approximately \$1,500,000.

14. CAUTION TO BIDDERS-LATE BIDS. - See Standard Form 22, "Instructions to Bidders", for the special provision entitled "Late Bids and Modifications or Withdrawals" which provides that late bids and modifications or withdrawals thereof sent through the mails will be considered ONLY IF SENT BY REGISTERED MAIL, OR BY CERTIFIED MAIL FOR WHICH A POSTMARKED RECEIPT HAS BEEN OBTAINED AS SPECIFIED IN SUCH PROVISION. (APR. 1962).

15. Reverse Signal Alarms are required in accordance with Par. SC-30.

16. Performance of Work by Contractor (Clause 40 of ALTERATIONS TO STANDARD FORM 23A AND ADDITIONAL GENERAL PROVISIONS). - Each bidder shall submit a description of the work which he will perform with his own organization (e.g., earthwork, paving, concrete, etc.), the percentage of the total work this represents, and the estimated cost thereof.

17. Safety Requirements. - Paragraph GC-16 of the General Conditions of the proposed specification incorporates and makes a part of the contract the Corps of Engineers Manual, EM 385-1-1, dated 13 March 1958,

READ THE FOLLOWING IN CONJUNCTION
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SUPPLEMENT TO INVITATION FOR BIDS
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entitled "General Safety Requirements", as amended. Such requirements will be strictly enforced and adhered to by the contractor. Those bidders who do not have a copy of this manual, or who are not aware of its contents may familiarize themselves with its provisions by contacting the Resident Engineer at the site or by visiting the Division Office in Waltham, Mass. Copies of this manual will be furnished the successful bidder after contract award has been made.

18. The Government reserves the right to award a contract under this invitation notwithstanding the expiration of wage rate determination of the Secretary of Labor set forth in SC-6. If the wage rate determination has expired (29 CFR 5.4(a)) a new wage rate determination may be substituted for the expired determination and award made on the basis of the bid as submitted without a change in the bid price.

19. Compliance Reports re Non-Discrimination Clause. - Bidders must complete statement attached to and forming part of the Bid Form relative to compliance reports re non-discrimination clause.

PART I
GENERAL CONDITIONS
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9/29/60

PART I

GENERAL CONDITIONS

GC-1. SCOPE OF WORK. - The work to be performed under this contract consists of furnishing all plant, materials, equipment, supplies, labor and transportation, including fuel, power, water (except any materials, equipment, utility or service, if any, specified herein to be furnished by the Government), and performing all work as required in the statement of work in the contract, in strict accordance with the specifications, schedules, and drawings, all of which are made a part hereof, and including such detail drawings as may be furnished by the Contracting Officer from time to time during the prosecution of the work in explanation of said drawings.

GC-2. CHARACTER OF WORK AND MECHANICS. - The work shall be executed in the best and most workmanlike manner by qualified, careful and efficient mechanics in strict accordance with the drawings and specifications.

GC-3. SITE INVESTIGATION. - The contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government as well as from information presented by the drawings and specifications made a part of this contract. Any failure by the contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government assumes no responsibility for any conclusions or interpretations made by the contractor on the basis of the information made available by the Government. The Government also assumes no responsibility for any understanding or representations made by its officers or agents during or prior to the execution of this contract, unless (i) such understanding or representations are expressly stated in the contract and (ii) the contract expressly provides that the responsibility therefor is assumed by the Government. Representations which are not expressly stated in the contract and for which liability is not expressly assumed by the Government in the contract shall be deemed only for the information of the contractor.

GC-4. OPERATIONS AND STORAGE AREAS. - a. All operations of the contractor (including storage of materials) upon Government premises shall be confined to areas authorized or approved by the Contracting

Officer. No unauthorized or unwarranted entry upon or passage through, or storage or disposal of materials shall be made upon Government premises. Government premises adjacent to the construction will be made available for use by the contractor without cost whenever such use will not interfere with other Government uses or purposes. The contractor shall be liable for any and all damage caused by him to such Government premises. The contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature or kind arising from any use, trespass or damage occasioned by his operations on premises of third persons.

b. Temporary buildings (storage sheds, shops, offices, etc.), may be erected by the contractor only with the approval of the Contracting Officer, and shall be built with labor and materials furnished by contractor without expense to the Government. Such temporary buildings and/or utilities shall remain the property of the contractor and will be removed by him at his expense upon the completion of the work. With the written consent of the Contracting Officer, such buildings and/or utilities may be abandoned and need not be removed.

c. The contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways or construct and use such temporary roadways as may be authorized by the Contracting Officer. Where materials are transported in the prosecution of the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, state or local law or regulation. When it is necessary to cross curbs or sidewalks, protection against damage shall be provided by the contractor and any damaged roads, curbs, or sidewalks shall be repaired by, or at the expense of the contractor.

GC-5. PROGRESS CHARTS AND REQUIREMENTS FOR OVERTIME WORK. - a. The contractor shall within 5 days or within such time as determined by the Contracting Officer, after date of commencement of work, prepare and submit to the Contracting Officer for approval a practicable schedule, showing the order in which the contractor proposes to carry on the work, the date on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time. The contractor shall revise the schedule as necessary to keep it current, shall enter on the chart the actual progress at the end of each week or at such intervals as directed by the Contracting Officer, and shall immediately deliver to the Contracting Officer three copies thereof. If the contractor fails to submit a progress schedule within the time herein prescribed, the Contracting Officer may withhold approval of progress payment estimates until such time as the contractor submits the required progress schedule.

b. If, in the opinion of the Contracting Officer, the contractor falls behind the progress schedule, the contractor shall take

such steps as may be necessary to improve his progress and the Contracting Officer may require him to increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant, and to submit for approval such supplementary schedule or schedules in chart form as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Government.

c. Failure of the contractor to comply with the requirements of the Contracting Officer under this provision shall be grounds for determination by the Contracting Officer that the contractor is not prosecuting the work with such diligence as will insure completion within the time specified. Upon such determination, the Contracting Officer may terminate the contractor's right to proceed with the work, or any separable part thereof, in accordance with the delays-damages article of the contract.

GC-6. SUBCONTRACTORS. - Within 7 days after the award of any subcontract either by himself or a subcontractor, the contractor shall deliver to the Contracting Officer a statement setting forth the name and address of the subcontractor and a summary description of the work subcontracted. The contractor shall, at the same time, furnish a statement signed by the subcontractor acknowledging the inclusion in his subcontract of Clause 21 of Standard Form 23A and all clauses set forth in Standard Form 19A. If, for sufficient reason, at any time during the progress of the work, the Contracting Officer determines that any subcontractor is incompetent or undesirable, he will notify the contractor accordingly and steps will be taken immediately for cancellation of such subcontract. Subletting by subcontractors shall be subject to the same regulations. Nothing contained in this contract shall create any contractual relation between the subcontractor and the Government.

GC-7. QUALITY OF ARTICLES, MATERIALS AND EQUIPMENT. - a. Where articles, materials and equipment are required to conform to standard specifications or tests of the Government or other authorities incorporated by reference, they will conform to the respective editions, including amendments, specified.

b. Any samples and descriptive data required shall -

(1) Be submitted within the time specified in these specifications or, if not specified, within a reasonable time before use to permit inspection and testing.

(2) Be shipped prepaid and delivered as specified in these specifications, or as directed by the Contracting Officer.

(3) Be marked to show the name of the material, trade name of manufacturer, place of origin, name and location of the project where the material represented by the sample is to be used, and the name of the contractor submitting the sample.

c. Samples not subjected to destructive tests may be retained until completion of the work but thereafter will be returned to the contractor, if he so requests in writing, at his own expense. Failure of any sample to pass the specified requirements will be sufficient cause for refusal to consider further any samples from the same manufacturer whose materials failed to pass the tests.

GC-8. PROTECTION OF MATERIAL AND WORK. - The contractor shall at all times protect and preserve all materials, supplies and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to inclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies and work performed are not adequately protected by the contractor such property may be protected by the Government and the cost thereof may be charged to the contractor or deducted from any payments due to him.

GC-9. PROTECTION OF EXISTING STRUCTURES, UTILITIES, WORK AND VEGETATION. - a. Existing structures, utilities, or other work that is to be retained shall be protected, to the extent possible, by the contractor during construction operations and if damaged shall be reported immediately to the Contracting Officer. Repairs, if required by the Contracting Officer, shall be accomplished by the contractor at no additional cost to the Government, except repairs to underground structures and lines, the location of which has not been shown or is not known or made known to the contractor. If the Contracting Officer determines that repairs to such underground structures or lines shall be made by the contractor, such repairs shall be accomplished under the applicable clause in the General Provisions of the contract. When utility lines that are to be removed are encountered, the contractor shall notify the Contracting Officer in ample time for measures to be taken to prevent interruption of the service.

b. The contractor will preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site which do not unreasonably interfere with the construction as may be determined by the Contracting Officer. The contractor will be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment, stockpiling of materials or tracking of grass areas by equipment.

c. Care will be taken by the contractor in felling trees authorized for removal to avoid any unnecessary damage to vegetation that is to remain in place. Any limbs or branches of trees broken during such operations, shall be trimmed with a clean cut and painted with an approved tree pruning compound if required by the Contracting Officer. The contractor will be liable for or may be required to replace or restore at his own expense all vegetation not protected and preserved as required herein that may be destroyed or damaged.

GC-10. POSSESSION PRIOR TO COMPLETION. - The Government shall have the right to take possession of or use any completed or partially completed

part of the work. Such possession or use shall not be deemed an acceptance of any work not completed in accordance with the contract. If such prior possession or use by the Government delays the progress of the work or causes additional expenses to the contractor, an equitable adjustment in the contract price and/or the time of completion will be made and the contract shall be modified in writing accordingly.

GC-11. RESERVED

GC-12. LABOR REPORTS. - The contractor shall promptly furnish, and shall cause any subcontractors to furnish in like manner, within 7 days after the regular payment date of each weekly payroll, to the Contracting Officer, a copy of such payroll together with a statement of compliance with respect to the wages paid each of its employees (which shall not be deemed to apply to persons in classifications higher than laborers and mechanics and those who are the immediate supervisors of such employees) engaged on the work. If the contractor or any of his subcontractors fails to furnish copies of such payrolls, the Contracting Officer may disapprove all or part of any progress payment estimate for the period covered by such payrolls until they are received by him. The contractor shall also prepare and furnish such labor reports as may be required by the Department of Labor.

GC-13. CLEANING UP. - The contractor shall, at all times, keep the construction area, including storage areas used by him, free from accumulations of waste material or rubbish and prior to completion of the work remove any rubbish from the premises and all tools, scaffolding, equipment, and materials not the property of the Government. Upon completion of the construction, the contractor shall leave the work and premises in a clean, neat and workmanlike condition satisfactory to the Contracting Officer.

GC-14. DEFINITIONS. --a. Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the direction, requirement, order, designation, or prescription of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory" or words of like import shall mean approved by, or acceptable to, or satisfactory to the Contracting Officer, unless expressly stated.

b. Wherever the words "shown", or "indicated" are used in the specifications, it shall be understood that "shown" or "indicated on the drawings" is intended, unless otherwise stated.

c. Basic rate as used in Clause 2, "Work Hours Act of 1962 -- Overtime Compensation", of Standard Form 19A means the basic hourly straight time wage rate actually paid laborers and mechanics and is not necessarily the same as the minimum hourly rate referred to in Clause 1,

"Davis-Bacon Act", of Standard Form 19A and in the paragraph of the specifications entitled "Rates of Wages".

GC-15. BONDS. - a. Payment Bond. - If the contract exceeds \$2,000, the contractor agrees to furnish a payment bond with good and sufficient surety or sureties acceptable to the Government for the protection of persons furnishing material or labor in connection with the performance of the work under this agreement on U. S. Standard Form No. 25-A or U. S. Standard Form No. 27-A. The penal sum of such payment bond will be as follows: (1) When the contract price is \$1,000,000 or less, 50 percent of the contract price; (2) When the contract price is in excess of \$1,000,000, but no more than \$5,000,000, 40 percent of the contract price; (3) When the contract price is more than \$5,000,000, \$2,500,000.

b. Performance Bond. - If the contract price exceeds \$2,000, the contractor further agrees to furnish a performance bond with good and sufficient surety or sureties acceptable to the Government in connection with the performance of the work under this agreement on U. S. Standard Form No. 25 or U. S. Standard Form No. 27. The penal sum of such performance bond will be 100 percent of the contract price.

c. Any bonds required hereunder will be dated as of the same date as the contract and will be furnished by the contractor to the Government at the time the contract is executed.

GC-16. ACCIDENT PREVENTION. - a. In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract; the contractor will comply with all pertinent provisions of Corps of Engineers Manual, EM 385-1-1, dated 13 March 1958, entitled "General Safety Requirements," as amended, and will also take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for the purpose.

b. Prior to commencement of work, the contractor will -

(1) Submit in writing his proposals for effectuating this provision for Accident Prevention.

(2) Meet in conference with representative of the Contracting Officer to discuss and develop mutual understandings relative to administration of the over-all safety program.

c. During the performance of work under the contract, the contractor shall comply with all procedures prescribed by the Contracting

Officer for the control and safety of persons visiting the job site and will comply with such requirements to prevent accidents as may be specified under the SPECIAL CONDITIONS of these specifications or issued by the Contracting Officer.

d. The contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, exposure data and all accidents resulting in death, traumatic injury, occupational disease, and/or damage to property, materials, supplies and equipment incident to work performed under this contract.

e. The Contracting Officer will notify the contractor of any non-compliance with the foregoing provisions and the action to be taken. The contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the contractor or his representative at the site of the work, shall be deemed sufficient for the purpose. If the contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop order shall be made the subject of claim for extension of time or for excess costs or damages by the contractor.

f. Compliance with the provisions of this article by subcontractors will be the responsibility of the contractor.

GC-17. INSPECTION. - The work will be conducted under the general direction of the Contracting Officer and is subject to inspection by his appointed inspectors to insure strict compliance with the terms of the contract. No inspector is authorized to change any provision of the specifications without written authorization of the Contracting Officer, nor shall the presence or absence of an inspector relieve the contractor from any requirements of the contract. As soon as practicable after the completion of the entire work, or any divisible part thereof as may be designated in these specifications, a thorough examination thereof will be made by the Contracting Officer at the site of the work. If such work is found to comply fully with the requirements of the contract, it will be accepted; and final payment therefor will be made in accordance with the article of the contract entitled "Payments to Contractors."

GC-18. ITEMS OF WORK. - A brief description of each item and the estimated quantity thereof are shown in the schedule attached to the Bid Form and listed in the Statement of Work in the contract. Unless otherwise provided in the SPECIAL CONDITIONS, within the limit of available funds, the contractor will be required to complete the work specified herein in accordance with the contract and at the contract price or prices.

PART II
SPECIAL CONDITIONS
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| SC-6 | Rates of Wages | SC-7 |
| SC-7 | Variations in Estimated Quantities | SC-9 |
| SC-8 & SC-9 | Omitted | |
| SC-10 | Water | SC-10 |
| SC-11 | Electricity | SC-11 |
| SC-12 | Omitted | |
| SC-13 | Layout of Work and Surveys | SC-11 |
| SC-14 | Payments for Mobilization | SC-12 |
| SC-15 | Damage to Work | SC-12 |
| SC-16 to SC-23, Incl. | Omitted | |
| SC-24 | Funds Available for Payments | SC-13 |
| SC-25 to SC-27, Incl. | Omitted | |
| SC-28 | Scheduling and Determination of Progress | SC-15 |

| <u>Paragraph No.</u> | <u>Paragraph Title</u> | <u>Page No.</u> |
|-------------------------------|--|-----------------|
| SC-29 | Time Extensions | SC-16 |
| SC-30 | Reverse Signal Alarms | SC-16 |
| SC-31 & SC-32 | Omitted. | |
| SC-33 | Certificates of Compliance | SC-17 |
| SC-34 to SC-36, Incl. Omitted | | |
| SC-37 | Contract Bid Breakdown | SC-17 |
| SC-38 | Temporary Heat | SC-17 |
| SC-39 | Omitted | |
| SC-40 | Soils and Materials Control | SC-18 |
| SC-41 | Construction Sign | SC-18 |
| SC-42 | Safety Sign | SC-19 |
| SC-43 | Accident Prevention | SC-19 |
| SC-44 & SC-45 | Omitted | |
| SC-46 | Government Field Office | SC-22 |
| SC-47 | Identification of Mechanized Equipment | SC-22 |
| SC-48 | Omitted | |
| SC-49 | Project Bulletin Board | SC-22 |
| SC-50 & SC-51 | Omitted | |
| SC-52 | Deviations from Contract Requirements | SC-22 |
| SC-53 | Contractor's Options | SC-23 |
| SC-54 & SC-55 | Omitted | |

| <u>Paragraph No.</u> | <u>Paragraph Title</u> | <u>Page No.</u> |
|----------------------|--|-----------------|
| SC-56 | Approved Aggregate Sources | SC-23 |
| SC-57 | Warning Signs | SC-24 |
| SC-58 | Plant | SC-24 |
| SC-59 | Payment | SC-24 |
| SC-60 | Commonwealth Standards | SC-25 |
| SC-61 | Factors Affecting the Prosecution of the Work | SC-25 |
| SC-62 | Definition of "Site of the Work" for Purposes of the Provisions of the Davis-Bacon Act, 40 U.S.C. 276a | SC-28 |
| SC-63 | Non-Discrimination Clause - Compliance Reports | SC-29 |

PART II
SPECIAL CONDITIONS

SC-1. COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK. - a. The contractor will be required to commence work under this contract within 15 calendar days after the date of receipt by him of notice to proceed, to prosecute said work with faithfulness and energy, and to complete the entire work ready for use not later than 750 calendar days after date of receipt by him of notice to proceed, except that the storage building will be completed in sufficient time to permit the required soils, concrete and materials control at the project site as required under Paragraph SC-40 to be performed. The time stated for completion shall include final clean-up of the premises. Paragraph SC-61 contains intermediate completion dates for segments of the work.

b. Time Extension for Topsoiling and Seeding. - In the event the contract completion date, as established in subparagraph "a" above, is thirty (30) days or more after the limiting date established for seeding in the Technical Provisions herein, the contract completion date for topsoiling and seeding will be the last date of the next succeeding period specified as acceptable for seeding.

SC-2. OMITTED.

SC-3. CONTRACT DRAWINGS AND SPECIFICATIONS. - Twenty sets of contract drawings (full-size or reduced size) and specifications will be furnished the contractor without charge, except for applicable publications incorporated into the Technical Provisions by reference. Additional sets will be furnished on request at the cost of reproduction. The work shall conform to the following contract drawings and maps, all of which form a part of these specifications and are available in the office of the U. S. Army Engineer Division, New England, 424 Trapelo Road, Waltham, Massachusetts.

| Sheet No. | Title | Rev. No. |
|-----------|-------|----------|
|-----------|-------|----------|

Drawing No. CON-8

- | | |
|---|--|
| 1 | Reservoir Map and Index |
| 2 | General Plan |
| 3 | Dam Embankment - Sections |
| 4 | Dam Embankment - Profiles |
| 5 | Outlet Works - Plan, Profile and Sections |
| 6 | Outlet Works - Inlet Structures - Concrete Details |
| 7 | Outlet Works - Conduit - Plans and Sections |
| 8 | Outlet Works - Outlet Structure - Concrete Details |
| 9 | Spillway - Plan, Profile and Sections |

Drawing No. CON-8 (Continued)

- 10 Spillway - Concrete Details No. 1
- 11 Spillway - Concrete Details No. 2
- 12 Dike - Plan, Profiles and Sections
- 13 Staff Gages, Log Boom and Parking Area
- 14 Bubble Gage Shelter - Details
- 15 Bubble Gage Shelter - Steel Reinforcement
- 16 Plaque - Sections and Detail
- 17 Plan of Foundation Explorations
- 18 Geologic - Log Sections - Dam
- 19 Geologic - Log Sections - Spillway
- 20 Geologic - Log Sections - Conduit
- 21 Record of Foundation Explorations No. 1
- 22 Record of Foundation Explorations No. 2
- 23 Record of Foundation Explorations No. 3
- 24 Record of Foundation Explorations No. 4
- 25 Plan of Borrow Explorations
- 26 Record of Borrow Explorations
- 27 Hydrographs

Drawing No. CON-9

- 1 Highway Relocations and Access Road - General Plan and Index
- 2 Highway Relocations and Access Road - Wales Road - Plan and Profile No. 1
- 3 Highway Relocations and Access Road - Wales Road - Plan and Profile No. 2
- 4 Highway Relocation and Access Road - Wales Road - Plan and Profile No. 3
- 5 Highway Relocations and Access Road - Wales Road - Plan and Profile No. 4
- 6 Highway Relocations and Access Road - Wales Road - Plan and Profile No. 5
- 7 Highway Relocations and Access Road - Wales Road - Plan and Profile No. 6
- 8 Highway Relocations and Access Road - Wales Road - Plan and Profile No. 7
- 9 Wales Road - Cross Sections - Sta. 0/00 to Sta. 3/00
- 10 Wales Road - Cross Sections - Sta. 3/50 to Sta. 5/00
- 11 Wales Road - Cross Sections - Sta. 5/50 to Sta. 6/94.99
- 12 Wales Road - Cross Sections - Sta. 7/50 to Sta. 9/50
- 13 Wales Road - Cross Sections - Sta. 10/00 to Sta. 11/00
- 14 Wales Road - Cross Sections - Sta. 11/50 to Sta. 13/50
- 15 Wales Road - Cross Sections - Sta. 14/00 to Sta. 15/00

Drawing No. CON-9 (Continued)

| | |
|----|--|
| 16 | Wales Road - Cross Sections - Sta. 15/50 to Sta. 17/00 |
| 17 | Wales Road - Cross Sections - Sta. 17/50 to Sta. 19/50 |
| 18 | Wales Road - Cross Sections - Sta. 20/00 to Sta. 22/50 |
| 19 | Wales Road - Cross Sections - Sta. 23/00 to Sta. 25/50 |
| 20 | Wales Road - Cross Sections - Sta. 26/00 to Sta. 31/50 |
| 21 | Wales Road - Cross Sections - Sta. 32/00 to Sta. 38/50 |
| 22 | Wales Road - Cross Sections - Sta. 39/00 to Sta. 42/00 |
| 23 | Wales Road - Cross Sections - Sta. 42/50 to Sta. 45/00 |
| 24 | Wales Road - Cross Sections - Sta. 45/50 to Sta. 51/50 |
| 25 | Wales Road - Cross Sections - Sta. 52/00 to Sta. 54/50 |
| 26 | Wales Road - Cross Sections - Sta. 55/00 to Sta. 57/50 |
| 27 | Wales Road - Cross Sections - Sta. 58/00 to Sta. 60/50 |
| 28 | Wales Road - Cross Sections - Sta. 61/00 to Sta. 62/50 |
| 29 | Wales Road - Cross Sections - Sta. 63/00 to Sta. 65/00 |
| 30 | Wales Road - Cross Sections - Sta. 65/50 to Sta. 68/50 |
| 31 | Wales Road - Cross Sections - Sta. 69/00 to Sta. 71/50 |
| 32 | Wales Road - Cross Sections - Sta. 72/00 to Sta. 74/50 |
| 33 | Wales Road - Cross Sections - Sta. 75/00 to Sta. 77/00 |
| 34 | Wales Road - Cross Sections - Sta. 77/50 to Sta. 78/00 |
| 35 | Wales Road - Cross Sections - Sta. 78/50 to Sta. 79/00 |
| 36 | Wales Road - Cross Sections - Sta. 79/50 to Sta. 80/50 |
| 37 | Wales Road - Cross Sections - Sta. 81/50 to Sta. 83/50 |
| 38 | Wales Road - Cross Sections - Sta. 84/00 to Sta. 86/00 |
| 39 | Wales Road - Cross Sections - Sta. 86/50 to Sta. 88/50 |
| 40 | Wales Road - Cross Sections - Sta. 89/00 to Sta. 90/50 |
| 41 | Wales Road - Cross Sections - Sta. 91/00 to Sta. 93/00 |
| 42 | Wales Road - Cross Sections - Sta. 93/50 to Sta. 95/00 |
| 43 | Wales Road - Cross Sections - Sta. 95/50 to Sta. 98/00 |
| 44 | Wales Road - Cross Sections - Sta. 98/50 to Sta. 100/50 |
| 45 | Wales Road - Cross Sections - Sta. 34/80, Sta. 62/64, Sta. 81/35 |
| 46 | Wales Road - Cross Sections - Sta. 60/25RT, Sta. 69/00-23'RT |
| 47 | Highway Relocations and Access Road - Wales Road - Culvert Crossing - Conant Brook - Plan and Sections. |
| 48 | Highway Relocations and Access Road - Wales Road - Culvert Crossing - Vinica Brook - Plan and Sections |
| 49 | Wales Road Culvert Crossings - Conant and Vinica Brooks - Profiles |
| 50 | Highway Relocations and Access Road - Wales Road - Turnoff-Plan |
| 51 | Wales Road - Turnoff Cross Sections - Sta. 2/00 to Sta. 8/50 |
| 52 | Highway Relocations and Access Road - Access Road - Plan and Profile No. 1 |

Drawing No. CON-9 (Continued)

- 53 Highway Relocations and Access Road - Access Road -
Plan and Profile No. 2 - Turnarounds and Sections
- 54 Access Road - Cross Sections - Sta. 0/00 to Sta. 4/50
- 55 Access Road - Cross Sections - Sta. 5/00 to Sta. 6/50
- 56 Access Road - Cross Sections - Sta. 7/00 to Sta. 9/50
- 57 Access Road - Cross Sections - Sta. 10/00 to Sta. 11/50
- 58 Access Road - Cross Sections - Sta. 12/00 to Sta. 14/00
- 59 Access Road - Cross Sections - Sta. 14/50 to Sta. 15/50
and Sta. 4/95 Skew
- 60 Highway Relocations and Access Road - Typical Road
Sections
- 61 Highway Relocations and Access Road - Foundation
Explorations No. 1
- 62 Highway Relocations and Access Road - Foundation
Explorations No. 2

SC-4. SHOP DRAWINGS. - The contractor shall submit to the Contracting Officer for approval seven (7) copies of all shop drawings as called for under the various headings of these specifications. These drawings shall be complete, shall be checked by the contractor prior to submission, and shall contain all required detailed information. If approved by the Contracting Officer, each copy of the drawings will be identified as having received such approval by being so stamped and dated. The contractor shall make any corrections required by the Contracting Officer. Five (5) sets of all shop drawings will be retained by the Contracting Officer and two sets will be returned to the contractor. The approval of the drawings by the Contracting Officer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the contractor of the responsibility for any errors which may exist, as the contractor shall be responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work. (See Paragraph SC-50, DEVIATIONS FROM CONTRACT REQUIREMENTS.) The submission by the contractor will be accompanied by ENG Form 4025, in seven copies. In addition, an information copy of this form, without inclosures, will be forwarded by the contractor to the Resident Engineer, Area Engineer, and Design Branch, Engineering Division, NED. ENG Form 4025 will be furnished to the contractor by the Government.

SC-5. PHYSICAL DATA. - Information and data furnished or referred to below are furnished for information only and it is expressly understood that the Government will not be responsible for any interpretation or conclusion drawn therefrom by the contractor.

a. Physical Conditions. - The physical conditions indicated on the drawings and in the specifications are the results of site investigations by surveys, borings and test pits. Soil samples and rock cores obtained from subsurface explorations made by the Government, field reports of explorations, records of water levels in observation wells, and results and data of all tests made by the Government on soil samples are available for examination and review at the Corps of Engineers, Foundations and Materials Branch, New England Division Headquarters, 424 Trapelo Road, Waltham, Massachusetts, telephone TWInbrook 4-2400, Ext. 387. The results of laboratory tests performed on soil samples obtained from subsurface explorations in the foundation areas of embankments and structures and in the Borrow Area are shown on Pages A-2 through A-12 (11 sheets) inserted at the end of the SPECIAL CONDITIONS. The classification of soil samples is in accordance with Drawing No. NEDGL 61-5C, "Unified Soil Classification", attached at the end of the SPECIAL CONDITIONS.

b. Weather Conditions. -

MONTHLY TEMPERATURES
(Degrees Fahrenheit)

| | <u>Worcester, Mass.</u> | | | <u>Westover Field, Mass.</u> | | |
|----------------------|-------------------------|-------------|-------------|------------------------------|-------------|-------------|
| Elevation (feet msl) | 628 | | | 240 | | |
| Years of Record | 68 | | | 19 | | |
| <u>Month</u> | <u>Mean</u> | <u>Max.</u> | <u>Min.</u> | <u>Mean</u> | <u>Max.</u> | <u>Min.</u> |
| January | 25.4 | 69 | -18 | 24.9 | 65 | -22 |
| February | 25.5 | 67 | -24 | 27.8 | 85 | -18 |
| March | 34.9 | 84 | -6 | 36.2 | 86 | -13 |
| April | 45.8 | 91 | 8 | 47.6 | 87 | 13 |
| May | 57.3 | 92 | 25 | 58.1 | 93 | 29 |
| June | 65.9 | 98 | 33 | 67.4 | 102 | 37 |
| July | 71.0 | 102 | 41 | 72.3 | 97 | 45 |
| August | 69.0 | 99 | 35 | 70.2 | 99 | 36 |
| September | 62.0 | 100 | 26 | 62.7 | 101 | 27 |
| October | 51.7 | 89 | 13 | 52.6 | 89 | 17 |
| November | 40.2 | 81 | 3 | 41.7 | 81 | 8 |
| December | 28.5 | 67 | -17 | 28.5 | 64 | -15 |
| Annual | 48.2 | 102 | -24 | 49.2 | 102 | -22 |

MONTHLY PRECIPITATION RECORD
(In Inches)

| | <u>Hubbardston, Mass.</u> | | | <u>Ware #2, Mass.</u> | | |
|----------------------|---------------------------|-------------|-------------|-----------------------|-------------|-------------|
| Elevation (feet msl) | 1,030 | | | 500 | | |
| Years of Record | 43 | | | 30 | | |
| <u>Month</u> | <u>Mean</u> | <u>Max.</u> | <u>Min.</u> | <u>Mean</u> | <u>Max.</u> | <u>Min.</u> |
| January | 2.92 | 6.17 | 0.61 | 3.35 | 6.46 | 1.00 |
| February | 2.44 | 4.83 | 1.18 | 2.87 | 5.55 | 0.93 |
| March | 3.38 | 8.89 | 1.32 | 3.66 | 7.52 | 1.59 |
| April | 3.60 | 7.62 | 1.01 | 3.41 | 6.49 | 0.71 |
| May | 3.45 | 6.96 | 1.17 | 3.69 | 6.27 | 0.70 |
| June | 4.00 | 11.82 | 0.46 | 4.46 | 8.29 | 1.22 |
| July | 4.10 | 8.00 | 1.07 | 4.13 | 10.14 | 1.21 |
| August | 3.45 | 9.83 | 0.79 | 4.18 | 20.65 | 0.46 |
| September | 4.25 | 18.28 | 0.94 | 4.12 | 15.70 | 1.02 |
| October | 3.28 | 8.05 | 0.13 | 3.10 | 9.12 | 0.81 |
| November | 4.04 | 7.44 | 0.95 | 3.83 | 8.41 | 0.83 |
| December | 2.96 | 6.83 | 0.50 | 3.33 | 6.11 | 0.74 |
| Annual | 41.87 | 61.34 | 32.81 | 44.13 | 62.78 | 33.51 |

MEAN MONTHLY SNOWFALL

| | <u>Westover Field, Mass.</u> | | <u>Hubbardston, Mass.</u> | |
|----------------------|------------------------------|--|---------------------------|--|
| Elevation (feet msl) | 240 | | 1,030 | |
| Years of Record | 16 | | 25 | |
| <u>Month</u> | <u>Snowfall</u> | | <u>Snowfall</u> | |
| January | 12.7 | | 15.0 | |
| February | 13.3 | | 14.2 | |
| March | 10.1 | | 7.6 | |
| April | 1.6 | | 2.5 | |
| May | 0 | | 0 | |
| June | 0 | | 0 | |
| July | 0 | | 0 | |
| August | 0 | | 0 | |
| September | 0 | | 0 | |
| October | Trace | | 0.4 | |
| November | 2.0 | | 4.2 | |
| December | 11.3 | | 10.1 | |
| Annual | 51.0 | | 54.0 | |

c. Transportation Facilities. - (1) State Route 32 passes through Monson, which is located approximately 4 miles south of Massachusetts Turnpike Interchange No. 8. Wales Road which connects Route 32 in South Monson with Route 19 in Wales, passes the project site.

(2) The New York Central Railroad and the Central Vermont Railroad serve the general area.

(3) It will be the responsibility of the contractor to make his own investigation of transportation facilities including railroads and public roads and private lands and make his own arrangements for their use.

SC-6. RATES OF WAGES. - a. The minimum wages to be paid laborers and mechanics on this project, as determined by the Secretary of Labor to be prevailing for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the pertinent locality, are as set forth below.

b. Any class of laborers and mechanics not listed below employed on this contract shall be classified or reclassified conformably to the schedule set out below by mutual agreement between the contractor and class of labor concerned, subject to the prior approval of the Contracting Officer. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question, accompanied by the recommendation of the Contracting Officer, shall be referred to the Secretary of Labor for final determination.

Predetermination No. AC-18,701 dated 2 March 1964 for Conant Brook Dam and Wales Road Relocation involving construction of an earth and rock filled dam with a spillway channel and concrete weir; concrete pipe conduit; construction of a bituminous surfaced road, Monson, Hampden County, Massachusetts.

| <u>Classification of Laborers and Mechanics</u> | <u>Minimum Rates of Wages per Hour</u> |
|--|--|
| Bricklayers | \$4.175 |
| Carpenters | 3.905 |
| Cement masons | 4.175 |
| Ironworkers, structural | 4.58 |
| " ornamental | 4.58 |
| " reinforcing | 4.58 |
| Piledrivermen | 4.10 |
| Roofers | 3.90 |
| Stonemasons | 4.175 |
| Welders - Receive rate prescribed for craft performing operation to which welding is incidental. | |

Apprentice Schedule

| Craft | Interval | Period and Rate* | | | | | | | |
|-------------|-----------|------------------|-----|-----|-----|-----|-----|-----|-----|
| | | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th |
| Ironworkers | 1000 hrs. | 60 | 70 | 75 | 80 | 85 | 90 | | |
| Bricklayers | 1000 hrs. | 50 | 55 | 65 | 75 | 85 | 95 | | |
| Carpenters | 1000 hrs. | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 |

*The apprentice rate is by percentage of the journeymen's rate unless otherwise indicated.

Classification of Laborers and Mechanics

Minimum Rates of Wages per Hour

HEAVY AND HIGHWAY:

| | |
|--|--------|
| Laborers | \$2.72 |
| Block pavers, Rammers, Curb Setters | 3.42 |
| Pipelayers | 2.87 |
| Hod Carriers, Pneumatic drill Ops; Jackhammermen | 2.97 |
| Blasters and powdermen | 3.22 |

Heavy and Highway Construction:

Power equipment operators:

| | |
|--|------|
| Shovels, crawler and truck cranes, derricks, backhoes, trenching machines, elevating graders, gradall, pile drivers, concrete pavers, draglines, clamshells, cableways | 3.95 |
| Rotary drill (with mounted compressor), compressor house (3 to 6 compressors), rock & earth boring machines (excluding McCarthy & similar drills), graders, front end loaders - 4 yard or over - (used as a loader) | 3.70 |
| Bulldozers, pushcarts, scrapers (self-propelled or tractor drawn), self-powered asphalt pavers, front end loaders (3/4 yard to 4 yards), mechanics, well drillers, pump-concrete machines, engineers or firemen on high pressure boilers, self-loading batch plants, well point operators | 3.50 |
| Hoists, conveyors, self-powered rollers & compactors, power pavement breakers, self-propelled material spreaders, self-powered concrete finishing machines, two bag mixers with skip, front end loaders (under 3/4 yard), McCarthy and similar drills, batch plants (not self-loading), bulk cement plants, engineer in charge of grease trucks containing power greasing equipment, welding machines (3 or more machines) | 3.35 |

Classification of Laborers
and Mechanics

Minimum Rates of Wages
per Hour

Heavy and Highway Construction

Power equipment operators (Continued):

| | |
|---|---------|
| Compressors (one or two, 315 cu. ft. or over), pumps (4" or over), tractors (without blade - drawing sheeps foot, rubber-tired roller, or other type of compactor, including machines for pulverizing or aerating soil) | \$3.275 |
| Compressors (up to 315 cu. ft.), small mixers with skip, oilers, pumps (up to 4"), grease trucks, power heaters, welding machines (one or two machines), A-frame trucks, fork-lifts | 2.75 |

Building, Heavy and Highway Construction

Truck Drivers:

| | |
|---|------|
| 2-axle trucks | 3.00 |
| 3-axle trucks | 3.05 |
| 4 & 5 axle trucks | 3.15 |
| low bed trailer, specialized earth moving equipment other than conventional | 3.25 |
| Helpers on low beds | 3.00 |

c. Health and Welfare Funds. - The wage rates contained in this decision are straight hourly wage rates. In some areas management and labor organizations in the construction industry have collectively bargained for health and welfare fund contributions. Such contributions are not included in wage rates determined by the Secretary of Labor for construction projects.

d. Payment on Piece-Work Basis. - The payment of employees on a piece-work basis is not, of itself, contrary to the Davis-Bacon Act. However, employers have a contractual and statutory obligation to assure that their employees are paid not less than the amounts due them computed on the basis of the hours worked at the prescribed wage rates for the classification involved, with appropriate overtime payment. Employers must maintain payroll records adequate to ascertain compliance and must submit payrolls showing actual hours worked and actual earnings received each week.

SC-7. VARIATIONS IN ESTIMATED QUANTITIES. - a. Where the quantity of a pay item in this contract which is identified on the Unit Price Schedule with an asterisk, is more than 115% or less than 87% of the estimated quantity stated in this contract, as modified, an equitable

adjustment in the contract price shall be made upon demand of either party. For overruns the equitable adjustment shall be limited to the number of units by which the actual quantity exceeds 115% of the estimated quantities. Where the actual quantity of any pay item is less than 87% of the estimated quantity stated in this contract, the final payment will be computed by applying the contract unit price to that portion of the work actually performed. For the portion of the work between the work actually performed and 87% of the estimated quantity stated in the contract, the contractor shall be paid an equitable negotiated amount that will exclude profit and include only an appropriate amount for mobilization, demobilization and other fixed charges.

b. In order to permit the contractor to distribute his indirect costs properly to Item No. 8, this item has been subdivided into more than two sub-items. All the contractor's indirect costs for this item will be included in the bid price for the first sub-item listed. Variation from the estimated quantity in the actual work performed under any second or subsequent sub-item will not be the basis for an adjustment in contract unit price.

c. If actual work performed under any item within the scope of Subparagraph a above is more than 105% or less than 96% of the estimated quantity stated in the contract, as modified, and if such variation causes an increase or a decrease in the time required for performance of this contract, the contract completion time will be adjusted as follows:

(1) If the quantity variation is such that it will cause an increase in the time necessary for completion, the Contracting Officer shall, upon receipt of a written request for an extension within 10 days from the beginning of such delay or within such further period of time which the Contracting Officer grants prior to the date of final settlement of the contract, ascertain the facts and make such adjustment for extending the completion date as in his judgment the findings justify.

(2) If the quantity variation is such that it will cause a decrease in the time necessary for completion, the Contracting Officer shall ascertain the facts and promptly notify the contractor in writing of his findings and the extent of adjustment.

d. If the parties fail to agree upon the adjustment to be made the dispute shall be determined as provided in Clause 6, "Disputes", of the General Provisions.

SC-8 and SC-9. OMITTED.

SC-10. WATER. - The responsibility shall be upon the contractor to provide and maintain at his own expense an adequate supply of water

for his use for construction and domestic consumption, and to install and maintain necessary supply connections and piping for same, but only at such locations and in such manner as may be approved by the Contracting Officer. Before final acceptance, temporary connections and piping installed by the contractor shall be removed in a manner satisfactory to the Contracting Officer.

SC-11. ELECTRICITY. - All electric current required by the contractor shall be furnished at his own expense. All temporary connections for electricity shall be subject to the approval of the Contracting Officer. All temporary lines will be furnished, installed, connected, and maintained by the contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed by the contractor in like manner at his expense prior to final acceptance of the construction.

SC-12. OMITTED.

SC-13. LAYOUT OF WORK AND SURVEYS. - a. Layout of Work. -
(1) The Government will establish all base lines, and bench marks and horizontal controls at the site of the work.

(2) From the base lines, bench marks, and controls established by the Government, the contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the contract drawings, subject to such modifications as the Contracting Officer may require to meet changed conditions or as a result of necessary modifications to the contract work.

(3) The contractor shall furnish, at his own expense, such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the base lines and bench marks established by the Government. It shall be the responsibility of the contractor to maintain and preserve all stakes and other marks established by the Contracting Officer until authorized to remove them, and if such marks are destroyed by the contractor or through his negligence prior to their authorized removal they may be replaced by the Contracting Officer, at his discretion, and the expense of replacement will be deducted from any amounts due or to become due the contractor. The Contracting Officer may require that work be suspended at any time when location and limit marks established by the contractor are not reasonably adequate to permit checking the work.

b. Quantity Surveys. - (1) The contractor shall furnish all personnel, equipment and material required to make all original and final surveys to determine the quantities forming the basis of final

payments. Such surveys will be made under the direct supervision of a Government employee who will also record the notes and supervise the computations by contractor personnel. Original copies of survey notes will become the property of the Government.

(2) The contractor shall make such surveys and computations as are necessary to determine the quantities of work performed or placed during each period for which a progress payment is to be made. All original field notes, computations, and other records taken by the contractor for the purpose of progress surveys shall be furnished promptly to the representative of the Contracting Officer and shall be used to the extent necessary in determining the proper amount of progress payments due to the contractor. Unless waived in each specific case, quantity surveys made by the contractor shall be made under the direction of a representative of the Contracting Officer.

c. Costs. - No separate or direct payment will be made to the contractor for performance of surveys for layout of work and determination of quantities and furnishing of notes as specified herein. All such costs of notes, computations, and of layout and survey work performed by the contractor will be considered as incidental to and included in the prices and payments for the items listed in the bid schedule.

d. Verification. - The Government may make checks as the work progresses to verify lines and grades established by the contractor and to determine the conformance of the completed work as it progresses with the requirements of contract specifications and drawings. Such checking by the Contracting Officer or his representative shall not relieve the contractor of his responsibility to perform all work in accordance with the contract drawings and specifications and the lines and grades given therein.

SC-14. PAYMENTS FOR MOBILIZATION. - Payments will not be made under this contract for mobilization.

SC-15. DAMAGE TO WORK. - a. The responsibility for damage to any part of the permanent work shall be as set forth in the article of the contract entitled "Permits and Responsibilities." However, if, in the judgment of the Contracting Officer, any part of the permanent work, except damage to new and permanent work resulting from flooding due to overtopping or other failure of cofferdams as specified in Subparagraph 2-02b, performed by the contractor is damaged by flood, earthquake, hurricane or tornado, which damage is not due to the failure of the contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the contractor will make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If,

in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work, equitable adjustment pursuant to Article 3, Changes, of the contract, will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the contractor's expense, regardless of the cause of such damage.

b. Maintenance of Drainage. - The contractor will be required to maintain adequate drainage through drainage structures and waterways during the life of the contract. When winter weather conditions are such as to cause obstruction of normal drainage ways by accumulations of ice, snow, or a combination of both, suitable approved measures shall be instituted by the contractor and maintained to prevent damage to materials or new or existing work.

SC-16 to SC-23, Inclusive. OMITTED.

SC-24. FUNDS AVAILABLE FOR PAYMENTS. - a. Such work as may be done under this contract in excess of the amount for which funds are available for payment as herein set forth, will be continued with funds hereafter appropriated and allotted for this work.

b. From funds heretofore appropriated by the Public Works Appropriation Act of 1964, the sum of \$50,000 is available for payments to the contractor for work performed under this contract.

c. If at any time it becomes apparent to the Contracting Officer that the balance of this allocation is in excess of the amount required to meet all payments due and to become due the contractor because of work performed and to be performed pursuant to his approved progress schedule, the right is reserved after due notice to the contractor to reduce said allocation by the amount of such excess.

d. If the rate of progress of the work is such that it becomes apparent to the Contracting Officer that the balance of this allocation and any allocation for this and any subsequent fiscal years during the period of this contract is less than that required to meet all payments due and to become due the contractor because of work performed or to be performed under this contract, the Contracting Officer may provide additional funds for such payments if there are funds available for such purpose. The contractor will be notified in writing of any additional funds so made available. However, it is distinctly understood and agreed that the amount of funds stated in b. above is the maximum amount the Government insures will be available during the current fiscal year and the Government is in no case liable for payments

to the contractor beyond this amount prior to having notified the contractor in writing of any additional funds that can be made available. Accordingly, no progress schedule will be approved (see Paragraph GC-5(a)) which contemplates progress requiring funds in excess of the amount stated to be available in b. above for the current fiscal year, and no progress schedule will be approved for any ensuing fiscal year which contemplates progress requiring funds in excess of the amount allocated by the Contracting Officer from funds subsequently made available, except as set forth and subject to the conditions in Subparagraph i. below.

e. It is expected that, during subsequent fiscal years over the period of this contract, Congress will make additional appropriations for expenditure on work under this contract. The Contracting Officer will notify the contractor of any additional allocation of funds to this contract when such funds become available. It is understood and agreed that the Government is in no case liable for damages in connection with this contract on account of delay in payments to the contractor due to lack of available funds. Should it become apparent to the Contracting Officer that the available funds will be exhausted before additional funds can be made available, the Contracting Officer will give at least 30 days written notice to the contractor that the work may be suspended. If the contractor so elects, after receipt of such notice, he may continue work under the conditions and restrictions under the specifications, so long as there are funds for inspection and superintendence, with the understanding, however, that no payment will be made for such work unless additional funds shall become available in sufficient amount. When funds again become available, the contractor will be notified accordingly. Should work be thus suspended, additional time for completion will be allowed equal to the period during which work is necessarily so suspended, as determined by the dates specified in the above-mentioned notices.

f. So long as funds are available, payments will be made monthly in accordance with article of the contract entitled "Payments to Contractors". The unit prices or lump-sum price or prices stated in the contract will be used in determining the amount to be paid for work performed by the contractor.

g. The procedure above described will be repeated as often as may be necessary on account of the exhaustion of available funds and the necessity of awaiting the appropriation of additional funds by Congress.

h. Should Congress fail to provide additional funds, the contract may be terminated and considered to be completed, at the option of the contractor, without prejudice to him or liability to the Government, at any time subsequent to 30 days after payments are discontinued, or at any time subsequent to 30 days after the passage of the Act which

would have but did not carry an appropriation for continuing the work or after the adjournment of the Congress which failed to make the necessary appropriations. However, if the funds cited in the contract are enough to extend the work beyond the end of the fiscal year and no new funds are allocated to the contract for the ensuing fiscal year, the contractor must first exhaust all the cited funds and thereafter he may, at his option, exercise the rights provided in this paragraph any time after payments are discontinued.

1. The progress chart prepared in accordance with GC-5(a) will be consistent with the amount of funds stated in Subparagraph b. above, as being currently available for the period of time from the date of contract award to the end of the fiscal year in which the contract was awarded, or at the option of the contractor, the chart may be prepared on the basis of accomplishment of work at a greater rate of progress for the period of time applicable to currently available funds. Any chart initially submitted for approval which contemplates progress at a greater rate than can be paid for with currently available funds will be approved only under the condition that such approval will in no way obligate the Government to make additional funds available for the work. That part of the chart which covers the work for which funds are not currently available will be prepared on the basis of a schedule considered to be practicable by the contractor for accomplishment of the work at such rate of progress as he may desire for completion within the terms of the contract. The progress chart will be revised each time the contractor is notified that additional funds are made available. Each revision will conform with the criteria stated above. With reference to the responsibilities for future funding of the work in accordance with the progress chart, attention is called to the preceding subparagraphs wherein the responsibilities of the Government are set forth for the furnishing of funds for the work. The approval of that part of the schedule covering work for which funds are not currently available will in no way obligate the Government to provide funds to accomplish work at the rate of progress indicated in the schedule.

SC-25 to SC-27, Inclusive. OMITTED.

SC-28. SCHEDULING AND DETERMINATION OF PROGRESS. - a. Independent of partial payments made pursuant to General Provisions 7, "Payments" (Standard Form 23A), progress schedules prepared under the requirements of GC-5, Progress Charts, and Requirements for Overtime Work, shall provide as scheduled progress for only 25 percent of the estimated invoiced cost of materials or equipment delivered to the site but not incorporated in the work as of the time of the scheduled delivery thereof.

b. In determining progress accomplished, the Contracting Officer will allow as an element of work accomplished (progress toward completion) only 25 percent of the invoiced cost of materials or

equipment delivered to the site, but not incorporated in the construction up to the time the materials or equipment are actually incorporated in the work.

SC-29. TIME EXTENSIONS. - Notwithstanding any other provisions of this contract, it is mutually understood that the Government has the right to determine the extent, if any, by which a change in plans or specifications or excusable delays will cause in the completion of various elements of construction. The Contracting Officer may unilaterally provide in a change order that a contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion date(s) for all other portions of the work would not be altered and further provide for an equitable readjustment of liquidated damages, if any, pursuant to the new completion schedule.

SC-30. REVERSE SIGNAL ALARMS - All self-propelled construction equipment, except light service trucks, panels, pickups, station wagons, crawler-type cranes, power shovels and draglines; whether moving alone or in combination shall be equipped with a reverse signal alarm. The alarm shall be mounted on the rear of the equipment and shall be so protected or constructed as to withstand severe wear and tear, adverse weather and unfavorable environmental working conditions and shall be certified by the manufacturer as fully meeting the following performance standards:

The alarm shall produce a relatively pure tone which shall peak within the American Standards Association standard octave pass-band of 600 to 2400 cycles per second and shall produce a 0.2 to 0.5 second audible warning within the initial three (3) feet of backward movement of the vehicle on which it is mounted and at regular intervals, not to exceed three (3) seconds throughout the backward movement. The alarm shall automatically cut out when backward movement ceases. The sound intensity of the alarm shall range from and not exceed 90-100 db (decibels) at a horizontal distance of 5 feet from the alarm.

Actuation of the alarm shall be automatic by direct connection to any part of the equipment that moves or acts in a manner distinctive only to the rearward movement of the vehicle with no manual controls of any kind between the source of actuation and the alarm. Where application of this requirement to specific types of equipment has impractical application, other means of actuation may be used upon written approval of the Contracting Officer.

The use of the alarm shall be in addition to prescribed requirements for signalmen.

SC-31 and SC-32. OMITTED.

SC-33. CERTIFICATES OF COMPLIANCE. - Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in three (3) copies. Each certificate shall be signed by an authorized officer of the manufacturing company and shall contain the name and address of the contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

SC-34 to SC-36, Inclusive. OMITTED.

SC-37. CONTRACT BID BREAKDOWN. - The contractor shall furnish within 10 days after date of award of contract a breakdown of each lump sum bid item. Partial payments will be based on this breakdown. The contractor's breakdown will be reviewed by the Contracting Officer to insure that costs are proportioned properly between early and late pay items. Any unbalanced items or other discrepancies will be revised by the Contracting Officer and the approved breakdown will be utilized as a basis for progress payments to the contractor.

SC-38. TEMPORARY HEAT. - a. All temporary heat required by the contractor in connection with his construction operations shall be furnished or provided by or at the expense of the contractor. Only temporary heating devices having the approval of the Underwriters' Laboratories, Inc., and approved by the Government representative in charge will be used. The contractor will be required to instruct his personnel in the use and operation of these portable type heaters. Such instructions shall be directed to any and all workmen who will have responsibilities connected with the use of such heaters. Instructions will include proper use, handling, location and placement of such heaters when in operation, fire protection provided, hazards connected with the use of such heaters and actions to be taken in case of fire. Portable oil-fired, or gas heaters will be so placed that the heating end will not be directed at combustible material within 10 feet and the unit, itself, shall be at least 2 feet from combustible material.

b. All materials used as tenting for temporary heated enclosures where oil-fired, or gas temporary heaters are used will be of a fire-resistant material. Clear polyethylene plastic material, or similar products will be permitted.

c. No Government-owned heating system will be available for the use of the contractor.

SC-39. OMITTED.

SC-40. SOILS AND MATERIALS CONTROL. - The contractor shall furnish when requested by the Contracting Officer and depending upon the scheduled and actual work operations in progress, two 1/2-ton pickup trucks, the maintenance and operation of which shall be the contractor's responsibility, and shall further provide two laborers depending on the work schedule, approved and qualified as stated below, to aid the Contracting Officer in the sampling and testing of soils, portland cement concrete, bituminous concrete and similar materials. Laborers shall have a high school education or shall have sufficient experience in the sampling and testing of soils and materials so as to attain a reasonable degree of competency in assisting in the performance of field and laboratory tests. Final acceptance by the Contracting Officer will not be made until the laborers have undergone a two-week training period at the New England Division Laboratories in Waltham, Mass. If the laborers furnished are not acceptable, the contractor shall furnish qualified replacements promptly upon request. Laborers found to be acceptable, if used sporadically, may be requested by name by the Contracting Officer and shall be furnished upon request, if still in the employ of the contractor. The personnel and equipment shall be made available within 30 days after receipt of notice to proceed and shall be assigned when needed until no further sampling and testing is required. The personnel and equipment shall be under the supervision and direction of the Contracting Officer and shall be such as to permit sampling and testing to be maintained concurrent with the progress of construction. Sampling and testing will include that necessary to determine that all construction conforms to contract requirements and such other sampling for the project as directed. The Government Area soils and material control laboratory for work under this contract will be located at the Westfield Area Office, Massachusetts State Armory, 137 Franklin Street, Westfield, Mass. The project laboratory will be located in the Storage Building as specified in Section 18. In the event that borrow areas outside the project limits are utilized for any necessary borrow materials, personnel and equipment will be provided to take the samples therefrom. No separate payment will be made for the services of the above equipment and personnel, the costs of which will be considered as a subsidiary obligation of the contractor.

SC-41. CONSTRUCTION SIGN. - The contractor shall furnish and erect a construction sign conforming to the requirements of Drawing No. CON-8, Sheet 27A, 12 ft. x 6 ft., attached at the end of the SPECIAL CONDITIONS. The sign shall be erected at a location selected by the Contracting Officer not later than 15 calendar days after notice to proceed. Upon completion of the work, the sign will remain the property of the contractor. No separate payment will be made for furnishing, erecting and removal of the sign.

SC-42. SAFETY SIGN. - The contractor shall construct a safety sign at a location directed by the Contracting Officer. The sign shall be 3 feet by 6 feet in size and shall conform to the requirements of Drawing No. 40-05-06, Sheet 1 of 1, attached hereto. The sign shall be erected as soon as possible and within 15 calendar days after the date of notice to proceed. The data required by the sign shall be corrected as necessary. No separate payment will be made for erecting and maintaining the safety sign and all costs in connection therewith will be considered a subsidiary obligation of the contractor. The sign will remain the property of the contractor. A previously constructed sign may be reused when satisfactorily reconditioned.

SC-43. ACCIDENT PREVENTION. - a. Contractor's Proposals. - The contractor's proposals for effectuating the requirements of Paragraph GC-16, "Accident Prevention" shall be submitted in quintuplicate to the Resident Engineer as the Contracting Officer's representative.

b. Blasting. - (1) All operations involving the transportation, storage and use of explosives shall be conducted in accordance with applicable laws and the Corps of Engineers' "General Safety Requirements Manual" a copy of which is available for inspection in the office of the Division Engineer and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, Inc.

(2) All vehicles assigned to the daily transportation of explosives and other dangerous articles will be inspected not less frequently than once a week. Vehicles which are occasionally used for this purpose shall be inspected within one week prior to such use.

(3) Inspection shall be performed by competent assigned contractor's personnel other than the operator of the vehicle inspected. Inspection forms will be approved by the Contracting Officer and a completed copy of each inspection will be furnished the Contracting Officer.

(4) Blasting will be permitted only when proper precautions are taken for the protection of all persons, work and property. The contractor shall be liable for all injuries or deaths of persons and all property damage caused by blasting or explosives. The contractor shall provide and keep on the project at all times a radio frequency ammeter or in lieu thereof, a pilot lamp which lights up brightly at 0.06 ampere as recommended in the Institute of Makers of Explosives Pamphlet No. 20, dated 1956, entitled "Radio Frequency Energy a Potential Hazard in the Use and Transportation of Electric Blasting Caps". Tests for radio energy hazards as described in above referenced Pamphlet No. 20 shall be made before loading every round. The contractor or his surety shall, prior to commencement of blasting

operations, make all necessary investigations including inspection of structures near the area of blasting and shall provide such vibration monitoring during blasting operations as may be necessary to assure protection of these structures in conformance with regulatory statutes or directives established by State or other authorities to limit the amount of vibration generated by blasting. These investigations shall be conducted by a qualified vibration engineer and copies of the results of such investigations including test data and records shall be furnished to the Contracting Officer.

c. Outlining Loaded Hole Areas. - The contractor shall be required to clearly outline any loaded hole area, or areas. This may be accomplished by roping off the entire loaded hole area, or by markers of sufficient height, color and spaced so that the entire loaded hole area will be clearly and definitely outlined. The exact method of outlining such areas shall have the prior approval of the Contracting Officer.

d. Handling and Use of Epoxy Resins. - The following precautions shall be taken when epoxy resin systems are specified for painting and similar uses:

(1) Full-face shields shall be provided for and worn by workmen during all mixing, blending and placing operations.

(2) Protective coveralls and neoprene-coated gloves shall be provided for and worn by all workmen engaged in the handling and use of epoxy resins.

(3) Facilities for maintaining personal cleanliness, including showers, washbowls, mild soaps or waterless skin cleansers, clean towels and clean coverall service shall be provided at all times.

(4) Protective creams of a suitable nature for the operation shall be supplied.

(5) Portable eye-washing facilities shall be maintained at mixing and placing operations.

(6) Adequate fire protection shall be maintained at all mixing and placing operations.

(7) Techniques of mixing resin compositions and applying them should be devised to prevent skin contact and minimize vapor exposure. This may be accomplished by:

(a) Mixing the epoxy resin components in a well ventilated hood, or out of doors.

(b) Confining laying-up, coating and curing operations to areas provided with exhaust ventilating facilities.

(c) Protecting with disposable paper bench tops and floor areas which are subject to contamination.

(d) Establishing and vigilantly maintaining meticulous housekeeping standards.

(8) Smoking or the use of spark or flame-producing devices shall be prohibited within 50 feet of mixing and placing operations.

(9) The mixing, placing, or storage of epoxy resin grout, binder or solvent shall be prohibited within 50 feet of any vehicle, equipment, or machinery.

(10) Contaminated clothing which cannot be decontaminated will be burned at an approved burning area at the end of each work day.

(11) Facilities shall be provided for decontamination of clothing and equipment at the job site.

(12) A clean supply of rags or a supply of disposable paper towels shall be supplied daily and discarded in a closed container when used.

(13) Workmen shall be restricted in passing from areas where they are handling epoxy resin to other areas in buildings, without first removing gloves, aprons, and washing hands.

(14) Prior to working with epoxy resins, employees shall receive instructions from the contractor supervisors in the use of epoxy resin systems, and shall be assured that these materials are not highly hazardous when proper precautions are exercised.

e. Communications. - The contractor will be required to provide and maintain a telephone or other means of communication which will be in an easily accessible location at each of the large construction areas on the project where potential fire hazard exists. Such means of communication will be accessible during all work hours.

f. Protective Headgear. - All employees of the contractor and other persons shall wear protective headgear (hard hats) at all times while in the work area(s). These work area(s) shall be all area(s) within the contract work limits.

SC-44 and SC-45. OMITTED.

SC-46. GOVERNMENT FIELD OFFICE. - Contractor shall provide a Field Office for the Government of approximately 200 square feet within fifteen (15) calendar days after receipt by him of notice to proceed. This space may be a separate building or may be partitioned space within the contractor's construction building. Office or space provided shall be weathertight and free from drafts. Windows shall be furnished as necessary to provide adequate natural light. The office shall be equipped with a cylinder lock on the door, a plywood top table approximately 6 ft. by 4 ft., and adequate heating, lighting and ventilating facilities. The contractor shall provide all services and supplies in connection with heating, lighting and maintaining the building. No separate payment will be made for the Government Field Office and all costs shall be included in the various items comprising the detailed bid schedule.

SC-47. IDENTIFICATION OF MECHANIZED EQUIPMENT. - All contractor's machinery, motor vehicles and mechanized equipment as may be required by the Contracting Officer, shall have posted in a conspicuous location on each piece of equipment, acceptable identification showing the owner's name and an identifying number.

SC-48. OMITTED.

SC-49. PROJECT BULLETIN BOARD. - The contractor shall furnish, install, and maintain during the life of the project a weathertight bulletin board approximately 3 ft. high by 5 ft. wide having not less than two hinged or sliding glazed doors with provisions for locking. The bulletin board shall be mounted, where and as approved by the Contracting Officer, in a prominent place accessible to all employees. The bulletin board shall remain the property of the contractor and shall be removed by him upon completion of the contract work. The following information, which will be furnished by the Government to the contractor, shall be posted on the bulletin board and shall be maintained by the contractor in easily readable condition at all times for the duration of the contract.

a. The Equal Employment Opportunity poster and Standard Form 38, "Notice to Labor Unions or Other Organizations of Workers" (when applicable) as required by General Provisions (Standard Form 23A) Clause 21, "Nondiscrimination in Employment".

b. The schedule of minimum wage rates for the contract as required by Labor Standards Provisions (Standard Form 19A) Provision 1, "Davis-Bacon Act", with the minimum wage rate poster (Form SOL-155).

SC-50 and SC-51. OMITTED.

SC-52. DEVIATIONS FROM CONTRACT REQUIREMENTS. - Deviations from contract requirements will not be permitted, except under unusual

circumstances. Submissions of shop drawings and materials will be assumed to be in conformance with plans and specifications, unless they contain an expressed declaration of a deviation, the reasons for it, and request for waiver.

SC-53. CONTRACTOR'S OPTIONS. - The Technical Provisions by specific references permit the contractor to select optional materials, items, systems, or equipment. The use of options is subject to the following conditions:

a. Once an option has been selected and approved, it shall be used for the entire contract.

b. The contractor will be required to coordinate his selection with the plans and specifications and to make all necessary adjustments without additional cost to the Government.

SC-54 and SC-55. OMITTED.

SC-56. APPROVED AGGREGATE SOURCES. - a. Concrete aggregates meeting the quality requirements of these specifications can be produced from the approved commercial sources listed below:

| <u>Type</u> | <u>Source</u> |
|-----------------------------------|--|
| Crushed gravel and processed sand | North Wilbraham Sand and Gravel Co., North Wilbraham, Mass. |
| Crushed gravel and processed sand | A. Girard and Sons, Inc., Ware, Mass. |

b. Concrete aggregates may be furnished from any of the above listed sources or at the option of the contractor may be furnished from any other source designated by the contractor and approved by the Contracting Officer, subject to the conditions hereinafter stated.

c. After the award of the contract, the contractor shall designate in writing only one source or one combination of sources from which he proposes to furnish aggregates. If the contractor proposes to furnish aggregates from a source or from sources not listed above, he may designate only a single source or single combination of sources for aggregates. Samples for acceptance testing shall be provided as required by Section 9 of the TECHNICAL PROVISIONS. If a source for coarse and/or fine aggregate so designated by the contractor is not approved for use by the Contracting Officer, the contractor may not submit for approval other sources but shall furnish the coarse and/or fine aggregate, as the case may be, from an approved source listed above at no additional cost to the Government.

d. Approval of a source of concrete aggregate is not to be construed as approval of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for concrete aggregate as determined by the Contracting Officer. Materials produced from an approved source shall meet all the requirements of Section 9 of the TECHNICAL PROVISIONS of these specifications. Approval of any of the above-listed sources pertains to the quality of raw materials only and does not constitute or imply approval or warranty of the available processing equipment or methods.

SC-57. WARNING SIGNS. - The contractor shall construct, erect, and maintain warning signs at various locations, where directed, along the perimeter of the contractor's work areas. These signs will generally be located where existing roads pass, enter, and approach the work areas. The signs shall be 4 ft. by 2 ft. in size and shall be securely mounted on wood posts provided and installed by the contractor. The signs may be made of 1/2-inch plywood, 3/4-inch dressed stock, not less than 8 inches in width held together with 3/4-inch by 2-inch battens on the rear, or from galvanized sheet metal (16 gage) properly reinforced. After assembly, all surfaces of the sign shall be given not less than two coats of a white exterior type finish paint. If wood is used, the wood shall be primed prior to finish painting. Lettering shall be of proper size for the intended use and shall be done by a sign painter, using quick-drying paint. The following words shall appear on the sign:

DANGER
BLASTING OPERATIONS
TURN OFF ALL 2-WAY RADIOS

Wood signs shall be fastened to wood posts with not less than three 2-inch galvanized wood screws. Metal signs shall be installed in similar manner. The warning signs shall be erected as soon as possible and within 30 calendar days after date of receipt of notice to proceed. No separate payment will be made for erecting all signs and maintaining and removal of the warning signs when the entire work is completed, and all costs in connection therewith will be considered a subsidiary obligation of the contractor.

SC-58. PLANT. - The contractor agrees to keep on the job sufficient plant to meet the requirements of the work. The plant shall be in satisfactory operating condition and capable of safely and efficiently performing the work as set forth in the specifications and the plant shall be subject to inspection by the Contracting Officer at all times.

SC-59. PAYMENT. - Payment for the various items listed in the Unit Price Schedule shall constitute full compensation for furnishing all plant, labor, equipment, appliances, and materials and for performing

all operations required to complete the work in conformity with the drawings and specifications. All costs in connection with work not specifically mentioned shall be included in the lump-sum contract price for the item to which the work pertains.

SC-60. COMMONWEALTH STANDARDS. - a. General. - (1) The Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges dated 1953 together with the Amendments and Addenda thereto, dated November 1963 (hereinafter referred to as the Massachusetts Standard Specifications) are incorporated into this contract by reference and shall be the Technical Provisions for the highway work except as otherwise specified in these specifications or indicated on the drawings. Amendments, addenda and revisions to the Massachusetts Standard Specifications issued by the Department of Public Works of the Commonwealth of Massachusetts on or before the date of the Invitation for Bids for this contract to referenced sections shall be considered as a part of the Massachusetts Standard Specifications.

(2) As referenced on the contract drawings and in the specifications, the Commonwealth of Massachusetts, Department of Public Works Construction Standards, dated 1958 (hereinafter referred to as the Massachusetts Construction Standards) are incorporated into this contract as part of the plans.

(3) All references on the drawings and specifications to the Standard Specifications and Construction Standards refer to the Massachusetts Standard Specifications and the Massachusetts Construction Standards, respectively.

b. Definition of Terms. - The Definition of Terms specified in Article 1 of the Massachusetts Standard Specifications are applicable except that the definitions for the following terms are changed as shown:

| | |
|---------------------------|-----------------------------|
| "Commonwealth" | - United States Government |
| "Department" | - Corps of Engineers, etc. |
| "Engineer" | - Contracting Officer, etc. |
| "Party of the First Part" | - United States Government |
| "Proposal" | - Bid |

c. Other. - Articles 2 through 34, inclusive, of Division I of the Massachusetts Standard Specifications are inapplicable except as referenced in Division II. Where Division I conflicts with the requirements of the U. S. Government under the Invitation and Bid Form, Part I, "GENERAL CONDITIONS", PART II, "SPECIAL CONDITIONS", and Standard Form 23, with Standard Form 23A with supplement thereto, or where Division II conflicts, the requirements of the U.S. Government shall govern. Division III is inapplicable.

SC-61. FACTORS AFFECTING THE PROSECUTION OF THE WORK - a. General.-
(1) The dam crosses the existing Monson Reservoir which is a water supply reservoir; therefore, no work will be accomplished within the limits of

this reservoir, nor will the existing water supply system be interrupted or disturbed, until the new water supply system has been completed by others and when so directed in writing by the Contracting Officer. The construction of the new water supply system is scheduled to be completed on or about 1 November 1964. In performing any work adjacent to or in the above-mentioned Monson Reservoir, except as specified in Sections, CONTROL AND DIVERSION OF WATER and EXCAVATION, the contractor shall use precautions not to contaminate the water in the reservoir.

(2) When the new water supply system has been completed, the contractor, in order to divert the brook through the outlet works and in order to construct the diversion cofferdams and perform work in the dam foundation and place fills in the dry, will contact the town officials to obtain permission to lower the water in the Monson Reservoir.

(3) Wales Road shall be kept open at all times for traffic until the relocated Wales Road has been substantially completed. Electric and telephone lines along Wales Road will be removed and relocated by others.

(4) The existing 12-inch water supply pipe shall not be disturbed until permission is granted in writing by the Contracting Officer.

b. Dam and Appurtenant Structures. - Until the new water supply system by others, and the relocation of Wales Road have been substantially completed, the contractor will be permitted to perform only the following operations in the construction area for the dam and appurtenant structures:

(1) Clearing, grubbing and stripping of the dam foundation, except as noted in Subparagraph SC-61a. above.

(2) Clearing and grubbing of Parts 1 and 2 of the Borrow Area.

(3) Excavation of the foundation cut-off trench between Sta. 1/25 and approximate Sta. 5/50. Excavation of the foundation drain trench between Sta. 2/25 and approximately Sta. 6/00.

(4) Construct the outlet works, except as noted in Subparagraph SC-61a. above.

(5) Excavation of Spillway Channel, except as noted in Subparagraph SC-61a. above.

(6) Initiate the foundation grouting.

(7) Construction of access road to subgrade for base course.

c. Dike. - The dike shall be completed as soon as possible during the first construction period. Munn and Sutcliffe Roads shall be kept open at all times for traffic.

d. Barricades and Signs. - The contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient red lights, bomb lights, reflectorized signs or signals, danger signals and signs, provide a sufficient number of policemen, watchmen and take all necessary precautions for the protection of the work and safety of the public. All applicable requirements of Articles 51, 52, and 53 of the Massachusetts Standard Specifications shall apply. Commencement of construction shall be contingent upon the prior installation of adequate signs, barricades, warning, etc., in the area concerned. Streets and highways closed to traffic shall be protected by effective barricades on which shall be placed acceptable reflectorized warning signs, lights and signals. The contractor shall provide and maintain, throughout the project, acceptable warning, direction and detour signs at all closures, intersections and along the construction and detour routes directing the traffic around the closed portion or portions of the streets and highways so that the temporary detour route or routes shall be indicated clearly throughout its or their entire length. All barricades, obstructions, warnings and signs shall be either reflectorized or lighted at night. All lights shall be kept burning from sunset to sunrise. All the aforesaid protective devices shall be in strict conformity with the plans and shall be as directed by the Contracting Officer. When construction is suspended for any reason, the barricades, warning and detour signs shall be established on a semi-permanent basis and shall be reflectorized. Installation and arrangement shall be approved by the Contracting Officer, and shall be designed to provide safe driving conditions on a basis equal to that of the rest of the traveled way which is not under construction. The contractor shall not receive additional compensation for the control of traffic, the furnishing, installation, maintenance and removal of lights, barricades, direction signs, warning and detour signs, reflectorization, etc., but the cost thereof shall be included in the unit prices bid for the items involved in the construction for the highway relocations and improvements. In the event that the contractor neglects to satisfactorily install and maintain barricades, warning and detour signs, the Contracting Officer may proceed to have such installations made, and the cost thereof shall be deducted from the monies due or to become due the contractor.

e. Existing Utilities. - (1) Existing utility and drainage lines that are shown on the drawings or the locations of which are made known to the contractor prior to excavation and that are to be retained, as well as utility and drainage lines and culverts constructed during excavation operations, shall be protected from damage during excavation

and backfilling, and if damaged, shall be satisfactorily repaired by the contractor at no additional cost to the Government. In the event that the contractor damages any existing utility lines that are not shown on the drawings or the locations of which are not known to the contractor, report thereof shall be made immediately to the Contracting Officer. If the Contracting Officer determines that repairs shall be made by the contractor, such repairs will be ordered under the clause of the General Provisions on the contract entitled CHANGED CONDITIONS. When utility lines that are to be removed are encountered within the area of operations, the contractor shall notify the Contracting Officer in ample time for the necessary measures to be taken to prevent interruption of the service.

(2) The contractor shall ascertain the exact location and elevations of the Tennessee Gas Company lines by hand excavated pits or other means prior to construction operations in the areas where these lines cross the new work. Proper precautions shall be taken to protect these lines at all times.

f. Existing Trees. - To the extent possible, the contractor shall save and protect all existing trees and shrubs on existing lawns, except those noted to be removed.

g. The contractor shall maintain and repair at his own expense those portions of existing paved and unpaved roads, bridges, and grassed areas which he, by necessity, damages or uses as access to the construction areas and for handling of materials during construction operations. The contractor shall also provide all necessary traffic control. At the contract completion, these roads, bridges and grassed areas shall be repaired and restored to match existing condition prior to use by the contractor.

SC-62. DEFINITION OF "SITE OF THE WORK" FOR PURPOSES OF THE PROVISIONS OF THE DAVIS-BACON ACT, 40 U.S.C. 276a. - The Comptroller General of the United States, in Decision B-148076 dated 26 July 1963, issued an opinion which conflicts with the long established ruling of the Solicitor of Labor defining the "site of the work."

Pending resolution of this difference, the Department of Defense position is to follow the ruling of the Solicitor of Labor that the "site of the work" refers to the site of the contract work and includes not only the limited physical area where the structure or improvement is erected or built but also certain other operations set up exclusively to furnish materials for the construction project. Accordingly, wages paid in connection with such operations shall be not less than the minimum wage rates, with appropriate adjustment for overtime hours, established by the Secretary of Labor and included in the contract. The contractor must maintain complete payroll records for all employees working at these temporary facilities and must submit to the Contracting Officer weekly payrolls for said employees.

The tests to be used in determining whether such a facility is within the coverage of the Act are basically:

(1) whether the facility is temporary and established virtually exclusively to meet the needs of the contract, or a series of contracts on an integrated project, rather than to serve the public generally; (2) whether the facility is located in the general area of the construction; and (3) whether the facility is integrated with the construction needs.

Any failure of the contractor to comply with the above may, pursuant to Clauses 6 and 7 of the Labor Standards Provisions (Standard Form 19-A), result in the Government terminating the contract or withholding from the contract amount funds necessary to assure proper wage payment.

SC-63. NON-DISCRIMINATION CLAUSE -- COMPLIANCE REPORTS. - a. In general, prime contractors holding construction contracts for \$100,000.00 or more and subcontractors holding subcontracts for \$50,000.00 or more must file compliance reports on Standard Forms 40, 40-A, and/or 41 in accordance with the instructions set forth on the reverse side of the form. Exemptions are also indicated on the form.

b. Prior to award of any subcontract regardless of amount the contractor will furnish to the Contracting Officer a representation, similar to that furnished by the contractor at the time of bidding, signed by the proposed subcontractor indicating submission of required compliance reports.

c. In addition to the furnishing of the subcontractor's representation concerning submission of required compliance reports, the contractor shall, prior to award of any subcontract, furnish the Contracting Officer with the following information:

(1) Name and address of the subcontractor.

(2) Nature of proposed subcontract work.

(3) Whether the subcontract value is more than \$10,000.00 but less than \$50,000.00, or more than \$50,000.00.

d. "Subcontract" for the purposes of the non-discrimination clause means any agreement made or purchase order executed by a prime contractor or a subcontractor where a material part of the supplies or services covered by such agreement or purchase order is being obtained for use in the performance of a contract, except that in the case of construction work at the site of construction the term subcontract shall apply regardless of tier.

(ADDRESS)

**SAFETY IS A JOB REQUIREDMENT
THIS CONTRACT HAS OPERATED SINCE
(APPROPRIATE DATE) WITHOUT A LOST TIME INJURY
PREVIOUS RECORD DAYS**

(APPROPRIATE DATE)

ELEVATION
SCALE 3" = 1'-0"

NOTE:

*This elevation is of a 3' x 6' Sign
See specifications for size required
under this contract.*

^ SPECIFICATIONS

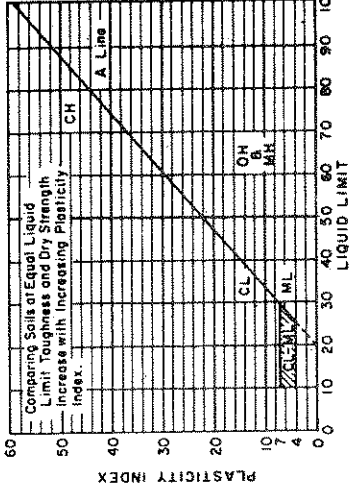
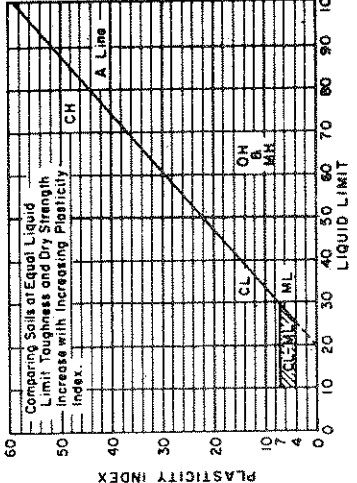
1. Pallet, rail and blocking shall be No. 1 yellow pine or approved equal S4-S-Fac. Spec. M.W.-175C.

SECTION C-C

3' x 6' SIGN

(4' x 8' SIGN SIMILAR)

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|---|---|--|---------------------------|---|---|--|--|--|---|--|--|---------------------------------|--|--|--|--|--|
| Major Divisions | | Group Symbols | Typical Names | Field Identification Procedures (Excluding particles larger than 3 in. and bosing fractions on estimated weight). | | Laboratory Classification Criteria | | | | | | | | | | | |
| Coarse-grained Soils More than half of material is larger than No. 200 sieve size. | Gravels More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the 1/4-in. size may be used as equivalent to the No. 4 sieve size). | Clean Gravels (Little or no fines) | GW | Well-graded gravels, gravel-sand mixtures, little or no fines. | Wide range in grain sizes and substantial amounts of all intermediate particle sizes. | Determine percentages of gravel and sand from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows: Less than 5% 5% to 12% More than 12% GW, GP, GM, GC, SW, SP, SC Borderline cases requiring use of dual symbols. | $C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for GW |  | PLASTICITY CHART For laboratory classification of fine-grained soils For example GW-GC, well-graded gravel-sand mixture with clay binder. | | | | | | | | |
| | | | GP | Poorly graded gravels, or gravel-sand mixtures, little or no fines. | Predominantly one size or a range of sizes with some intermediate sizes missing. | | | | | | | | | | | | |
| | | Gravels with Fines (Appreciable amount of fines) | GM | Silty gravels, gravel-sand-silt mixtures. | Nonplastic fines or fines with low plasticity (for identification procedures see ML below). | | | | | Above "A" line with PI between 4 and 7 or borderlining cases requiring use of dual symbols. | | | | | | | |
| | | | GC | Clayey gravels, gravel-sand-clay mixture. | Plastic fines (for identification procedures see CL below). | | | | | Atterberg limits above "A" line with PI greater than 7 | | | | | | | |
| Fine-grained Soils More than half of material is smaller than No. 200 sieve size. | Sands More than half of coarse fraction is smaller than No. 4 sieve size. (For visual classification, the 1/4-in. size may be used as equivalent to the No. 4 sieve size). | Clean Sands (Little or no fines) | SW | Well-graded sands, gravelly sands, little or no fines. | Wide range in grain size and substantial amounts of all intermediate particle sizes. | Determine percentages of gravel and sand from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows: Less than 5% 5% to 12% More than 12% GW, GP, GM, GC, SW, SP, SC Borderline cases requiring use of dual symbols. | $C_u = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for SW |  | PLASTICITY CHART For laboratory classification of fine-grained soils For example GW-GC, well-graded gravel-sand mixture with clay binder. | | | | | | | | |
| | | | SP | Poorly graded sands or gravelly sands, little or no fines. | Predominantly one size or a range of sizes with some intermediate sizes missing. | | | | | | | | | | | | |
| | | Sands with Fines (Appreciable amount of fines) | SM | Silty sands, sand-silt mixtures. | Nonplastic fines or fines with low plasticity (for identification procedures see ML below). | | | | | Limits plotting in hatched zone with PI between 4 and 7 or borderlining cases requiring use of dual symbols. | | | | | | | |
| | | | SC | Clayey sands, sand-clay mixtures. | Plastic fines (for identification procedures see CL below). | | | | | Atterberg limits above "A" line with PI greater than 7 | | | | | | | |
| | | | Identification Procedures | | | | | | | | | | | | | | |
| | | On Fraction Smaller than No. 40 Sieve Size | | Dry Strength (Crushing Characteristics) | | | | | | Disintegrability (Reaction to shaking) | | Toughness (Consistency near PL) | | | | | |
| | | None to slight | | None to slight | | | | | | Quick to slow | | None | | | | | |
| | | Medium to high | | Medium to high | | | | | | None to very slow | | Medium | | | | | |
| Slight to medium | | Slight to medium | | Slow | | Slight | | | | | | | | | | | |
| Slight to medium | | Slight to medium | | Slow to none | | Slight to medium | | | | | | | | | | | |
| High to very high | | High to very high | | None | | High | | | | | | | | | | | |
| Medium to high | | Medium to high | | None to very slow | | Slight to Medium | | | | | | | | | | | |
| Readily identified by color, odor, spongy feel and frequently by fibrous texture. | | | | | | | | | | | | | | | | | |
| Highly Organic Soils | | | | | | | | | | | | | | | | | |
| Peat and other highly organic soils. | | PT | | | | | | | | | | | | | | | |

For further information on Unified Soil Classification, refer to "The Unified Soil Classification System," Volumes 1 and 2, Technical Memorandum No. 3-357, published by U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. File copies may be obtained at Headquarters, U. S. Army Engineer Division, New England, 424 Tropic Road, Waltham, Massachusetts, Building 141, Foundation and Materials Branch.

Adapted by Corps of Engineers and Bureau of Reclamation, January 1952.

NEDGL 61-5C

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CUFT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|---------------------|-------------|----|------------------|-----------------------------|------|---------------------|--------------------------|-------|-------|---------------------------|-------|-------------|-------|--|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ mm. | LL | PL | | TOTAL | -NO4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | TOTAL | - NO 4 | SHEAR | CONSOL. | PERM. | |
| FD-1 | 689.4 | J-5 | 5.0-10.0 | SM | 9 | 50 | 41 | | 17 | 14 | | | | | | | | | | | | |
| | | J-7 | 10.0-13.8 | CM | 44 | 37 | 19 | 0.021 | NonPlastic | | | | | | | | | | | | | |
| | | J-11 | 20.0-22.2 | SP-SM | 8 | 82 | 10 | | | | | | | | | | | | | | | |
| | | J-14 | 25.7-27.0 | SM | 31 | 53 | 16 | | | | | | | | | | | | | | | |
| FD-2 | 787.1 | J-5 | 5.0-10.0 | SM | 7 | 64 | 29 | | | | | | | | | | | | | | | |
| | | J-7 | 15.0-17.0 | SM | 8 | 64 | 28 | | | | | | | | | | | | | | | |
| | | J-9 | 20.0-21.2 | SM | 21 | 50 | 29 | | NonPlastic | | | | | | | | | | | | | |
| | | J-13 | 30.0-31.6 | SM | 3 | 60 | 37 | 0.006 | | | | 7.9 | | | | | | | | | | |
| | | J-15 | 35.0-36.0 | SM | 4 | 60 | 36 | 0.01 | | | | 7.8 | | | | | | | | | | |
| FD-3 | 745.0 | J-4 | 5.0-10.0 | SM | 9 | 58 | 33 | 0.008 | | | | | | | | | | | | | | |
| | | J-9 | 19.0-20.0 | SM-SC | 14 | 46 | 40 | 0.0016 | 19 | 13 | | 11.0 | | | | | | | | | | |
| | | J-16 | 35.0-36.0 | SC | 31 | 35 | 34 | 0.0016 | 21 | 13 | | 9.3 | | | | | | | | | | |
| FD-4 | 730.1 | B-7 | 5.0- 7.3 | SP-SM | 4 | 87 | 9 | 0.088 | | | | | | | | | | | | | | |
| FD-6 | 689.7 | J-3 | 3.2- 5.0 | GP-CM | 48 | 44 | 8 | 0.09 | | | | | | | | | | | | | | |
| | | J-4 | 5.0-10.0 | CM | 44 | 42 | 14 | 0.044 | | | | | | | | | | | | | | |
| | | J-7 | 15.0-20.0 | SM | 29 | 48 | 23 | 0.012 | | | | | | | | | | | | | | |
| | | J-9 | 25.0-29.2 | ML | 0 | 7 | 93 | 0.018 | NonPlastic | | | | | | | | | | | | | |
| | | J-10 | 29.8-34.0 | ML | 0 | 2 | 98 | 0.01 | | | | | | | | | | | | | | |
| | | J-13 | 36.6-39.2 | SM | 7 | 79 | 14 | 0.054 | | | | | | | | | | | | | | |
| FD-7 | 690.0 | J-6 | 10.0-15.0 | GP-CM | 48 | 45 | 7 | 0.13 | | | | | | | | | | | | | | |
| | | J-7 | 15.0-20.0 | GP-CM | 55 | 36 | 7 | 0.11 | | | | | | | | | | | | | | |
| | | J-10 | 23.0-25.0 | GP-CM | 50 | 43 | 7 | 0.13 | | | | | | | | | | | | | | |
| | | J-11 | 25.0-29.2 | GP-CM | 60 | 29 | 11 | 0.052 | | | | | | | | | | | | | | |
| | | J-13 | 30.0-32.6 | ML | 0 | 1 | 99 | 0.0021 | | | | | | | | | | | | | | |
| | | J-16 | 35.0-37.7 | CM | 58 | 24 | 18 | 0.032 | | | | | | | | | | | | | | |

CONANT BROOK DAM

* PROVIDENCE VIBRATED DENSITY TEST

NED FORM JUL 63 510

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CUFT | | OTHER TESTS | | |
|-----------|---------------|--------------------|-----------|-------------|---------------------|--------|---------|--------------------|-------------|----|------------------|-----------------------------|---------|---------------------|--------------------------|--------------|-------|---------------------------|-------------|-------------|---------|-------|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ mm | LL | PL | | TOTAL | - NO. 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | STD. AASHO # | PVD # | TOTAL | - NO. 4 | SHEAR | CONSOL. | PERM. |
| FD-8 | 709.8 | J-3 | 5.0-10.0 | SM | 19 | 41 | 40 | 0.003 | | | | 10.1 | | | | | | 134.7 | Plug Sample | | | |
| | | J-4 | 10.0-15.0 | SM | 11 | 46 | 43 | 0.001 | | | | 7.1 | | | | | | 144.0 | Plug Sample | | | |
| | | J-7 | 25.0-27.0 | SM | 11 | 60 | 29 | 0.013 | | | | | | | | | | | | | | |
| FD-9 | 704.9 | J-5 | 10.0-13.1 | ML-CL | 5 | 26 | 69 | 0.001 | | | | 9.4 | | | | | | 137.6 | Plug Sample | | | |
| | | J-6 | 13.1-15.0 | SM-SC | 10 | 44 | 46 | 0.001 | | | | | | | | | | | | | | |
| FD-10 | 712.9 | J-4 | 5.0-10.0 | SM | 10 | 57 | 33 | 0.006 | | | | 10.0 | | | | | | 133.0 | Plug Sample | | | |
| | | J-5R | 5.0-10.0 | SM | 4 | 62 | 34 | 0.005 | | | | | | | | | | | | | | |
| | | J-8 | 15.0-20.0 | SM | 10 | 61 | 29 | 0.01 | | | | | | | | | | | | | | |
| | | J-14 | 25.0-30.0 | SM | 13 | 53 | 34 | 0.0095 | | | | | | | | | | | | | | |
| | | J-20 | 35.0-38.0 | SM | 7 | 59 | 34 | 0.007 | | | | | | | | | | | | | | |
| | | J-23 | 38.0-39.3 | SM | 7 | 55 | 38 | 0.005 | | | | | 13.0 | | | | | | 138.0 | Plug Sample | | |
| FD-10A | 712.9 | Extension of FD-10 | | | | | | | | | | | | | | | | | | | | |
| | | J-3 | 40.5-41.0 | SM | 17 | 55 | 28 | 0.0095 | | | | | | | | | | | | | | |
| | | J-5 | 50.0-51.5 | SM | 13 | 55 | 32 | 0.003 | | | | | | | | | | | | | | |
| | | J-8 | 60.0-61.8 | SM | 27 | 50 | 23 | 0.02 | | | | | | | | | | | | | | |
| FD-11 | 697.6 | J-4R | 5.0-10.0 | SM | 19 | 63 | 13 | | | | | | | | | | | | | | | |
| FD-12 | 688.4 | J-3 | 2.8- 5.0 | GP | 63 | 33 | 4 | 0.24 | | | | | | | | | | | | | | |
| | | J-6 | 8.5-10.0 | GP | 64 | 33 | 3 | 0.34 | | | | | | | | | | | | | | |
| | | J-8 | 13.5-15.0 | SP-SM | 38 | 57 | 5 | 0.18 | | | | | | | | | | | | | | |
| | | J-10R | 15.0-17.2 | SM | 11 | 64 | 25 | 0.016 | | | | | | | | | | | | | | |
| | | J-12 | 20.7-23.4 | SM | 19 | 55 | 26 | 0.015 | | | | | | | | | | | | | | |
| FD-13 | 688.2 | J-4 | 4.1- 5.0 | GP | 48 | 47 | 5 | 0.18 | | | | | | | | | | | | | | |
| | | J-5 | 5.0- 5.8 | SM | 0 | 94 | 6 | 0.09 | | | | | | | | | | | | | | |
| | | J-7 | 6.7- 8.6 | SM | 19 | 55 | 26 | 0.015 | | | | | | | | | | | | | | |

CONANT BROOK DAM

* PROVIDENCE VIBRATED DENSITY TEST

FORM 510
JUL 63

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CU FT | | OTHER TESTS | | |
|-----------|---------------|---|--|--|----------------------------------|----------------------------------|----------------------------------|---------------------------------------|-------------|----|------------------|----------------------|------|---------------------|--------------------------|-------|-------|----------------------------|-------|-------------|-------|--|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ mm. | LL | PL | | TOTAL | -NO4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | TOTAL | -NO4 | SHEAR | CONSOL | PERM. | |
| FD-14 | 707.1 | J-1 J-3 J-4 | 1.2- 4.1 5.0- 6.7 6.7- 8.1 | SM SP-SM SM | 0 24 27 | 63 64 57 | 37 12 16 | | | | | | | | | | | | | | | |
| FD-15 | 695.6 | J-2 | 1.6- 4.7 | GP-GM | 57 | 36 | 7 | 0.10 | | | | | | | | | | | | | | |
| FD-17 | 764.5 | J-4 J-5 | 2.5- 5.0 5.0- 8.0 | SM SM | 31 19 | 51 63 | 18 18 | | | | | | | | | | | | | | | |
| FD-18 | 746.3 | J-2 | 2.3- 4.2 | SM | 32 | 51 | 17 | | | | | | | | | | | | | | | |
| FD-19 | 695.2 | J-2 J-4 J-6 J-8 J-9 J-13 | 2.1- 5.0 6.2-10.0 10.0-15.0 16.0-17.8 17.8-20.0 29.0-30.8 | SP-SM SM SM SM GP-GM SM | 30 19 18 22 45 33 | 58 51 66 64 45 49 | 12 30 16 14 10 18 | 0.007L 0.051 0.074 0.029 | | | | | | | | | | | | | | |
| FD-20 | 725.1 | J-3 | 2.1- 4.9 | GP-GM | 53 | 40 | 7 | 0.10 | | | | | | | | | | | | | | |
| FD-21 | 727.6 | J-3 | 2.4- 5.0 | SM | 31 | 50 | 19 | | | | | | | | | | | | | | | |
| FD-22 | 770.2 | J-2 | 0.8- 4.9 | GM | 46 | 39 | 15 | | | | | | | | | | | | | | | |
| FD-23 | 698.2 | J-6 J-10 J-13 J-24 J-32 | 10.0-15.0 20.0-22.7 25.0-27.4 27.4-39.5 48.9-50.0 | SM SP-SM SM ML SM | 11 16 19 11 6 | 56 78 69 24 78 | 33 6 12 65 16 | 0.01 0.12 0.013 | | | | | | | | | | | | | | |
| FD-24 | 764.4 | J-3 | 5.0-10.0 | GM | 40 | 39 | 21 | 0.028 | | | | | | | | | | | | | | |

NED FORM 510
JUL 63

* PROVIDENCE VIBRATED DENSITY TEST

CONANT BROOK DAM

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CUFT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|--------------------|-------------|----|------------------|-----------------------------|--------|---------------------|--------------------------|-------|-------|---------------------------|-------|-------------|-------|--|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ mm | LL | PL | | TOTAL | - NO 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | TOTAL | - NO 4 | SHEAR | CONSOL. | PERM. | |
| FD-25 | 764.2 | J-3 | 2.1- 5.0 | SP-SM | 45 | 47 | 8 | 0.15 | | | | | | | | | | | | | | |
| FD-26 | 759.9 | J-3 | 2.5- 4.0 | SP-SM | 20 | 68 | 12 | | | | | | | | | | | | | | | |
| | | J-6 | 8.5-10.5 | SM | 37 | 36 | 27 | 0.02 | | | | | | | | | | | | | | |
| FD-27 | 720.6 | J-4 | 5.0- 6.2 | SM | 15 | 57 | 28 | 0.011 | | | | | | | | | | | | | | |
| | | J-7 | 10.0-15.0 | ML-CL | 10 | 39 | 51 | < 0.001 | | | | | | | | | | | | | | |
| | | J-11 | 16.0-20.0 | SM | 19 | 39 | 42 | 0.0029 | | | | | | | | | | | | | | |
| | | J-15 | 23.0-24.6 | SM | 10 | 50 | 40 | 0.001 | | | | | | | | | | | | | | |
| | | J-23 | 30.7-32.2 | SM | 23 | 48 | 29 | 0.011 | | | | | | | | | | | | | | |
| | | J-28 | 34.5-37.0 | SM | 14 | 61 | 25 | 0.02 | | | | | | | | | | | | | | |
| FD-28 | 760.3 | J-33 | 40.0-42.0 | SM | 6 | 62 | 32 | 0.013 | | | | | | | | | | | | | | |
| | | J-2 | 0.7- 5.0 | SP-SM | 25 | 68 | 7 | 0.10 | | | | | | | | | | | | | | |
| | | J-3 | 2.2- 5.0 | GP-CM | 52 | 41 | 7 | 0.14 | | | | | | | | | | | | | | |
| | | J-3 | 5.0- 7.5 | CM | 52 | 32 | 16 | | | | | | | | | | | | | | | |
| FD-31 | 721.5 | J-5 | 6.1-10.0 | SM | 6 | 54 | 40 | 0.0048 | | | | | | | | | | | | | | |
| | | J-8R | 10.0-15.0 | SM | | | | | | | | | | | | | | | | | | |
| | | J-12 | 20.0-23.0 | SM | 10 | 62 | 28 | 0.019 | | | | | | | | | | | | | | |
| | | J-14 | 23.0-25.0 | SM | 4 | 62 | 34 | 0.008 | | | | | | | | | | | | | | |
| | | J-16 | 25.0-27.0 | SM | 5 | 58 | 37 | 0.006 | | | | | | | | | | | | | | |
| | | J-26B | 35.0-35.9 | SM | 14 | 53 | 33 | 0.011 | | | | | | | | | | | | | | |
| FD-32 | 771.4 | J-30 | 42.0-44.3 | SM | 19 | 52 | 29 | 0.014 | | | | | | | | | | | | | | |
| | | J-44 | 57.3-58.6 | SM | 11 | 54 | 35 | 0.0039 | | | | | | | | | | | | | | |
| | | J-2 | 0.9- 4.5 | SM | 33 | 42 | 25 | | | | | | | | | | | | | | | |
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SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS - | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CUFT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|-----------------------|--------|---------|-----------|-------------|----|------------------|-----------------------------|--------|---------------------|--------------------------|-----------------|-------|---------------------------|-------|-------------|-------|--|
| | | | | | GRAVEL % | SAND % | FINES % | D 10 M.M. | LL | PL | | TOTAL | - NO 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | * PVD LBS/CU FT | TOTAL | - NO 4 | SHEAR | CONSOL. | PERM. | |
| FD-33 | 752.5 | J-1 | 0.9- 5.0 | SM | 11 | 72 | 17 | | | | | | | | | | | | | | | |
| FD-34 | 744.7 | J-3 | 2.5- 5.0 | ML | 0 | 31 | 69 | 0.01 | | | | | | | | | | | | | | |
| FD-35 | 715.2 | J-5 | 5.0-10.0 | SM | 13 | 67 | 20 | | | | | | | | | | | | | | | |
| | | J-6 | 10.0-12.0 | GP-SM | 18 | 43 | 9 | 0.08 | | | | | | | | | | | | | | |
| FD-37 | 691.8 | J-3 | 5.5-10.0 | SM | 14 | 55 | 31 | 0.012 | | | | | | | | | | | | | | |
| | | J-6 | 15.0-18.0 | SP | 17 | 48 | 5 | 0.20 | | | | | | | | | | | | | | |
| FD-38 | 763.9 | J-4 | 3.3- 5.0 | SP-SM | 3 | 85 | 12 | | | | | | | | | | | | | | | |
| | | J-8 | 7.8-10.0 | SM | 20 | 38 | 42 | 0.025 | | | | | | | | | | | | | | |
| | | J-13 | 15.0-17.5 | SP-SM | 29 | 64 | 7 | 0.091 | | | | | | | | | | | | | | |
| FD-39 | 754.5 | J-4 | 6.0- 9.6 | GP | 50 | 47 | 3 | 0.17 | | | | | | | | | | | | | | |
| | | J-6 | 12.5-15.0 | SP-SM | 0 | 94 | 6 | 0.10 | | | | | | | | | | | | | | |
| | | J-8 | 17.0-20.0 | SP | 8 | 89 | 3 | 0.14 | | | | | | | | | | | | | | |
| FD-40 | 753.6 | J-6 | 7.5-13.0 | SP-SM | 0 | 94 | 6 | 0.083 | | | | | | | | | | | | | | |
| | | J-11 | 15.0-20.0 | SP | 34 | 61 | 5 | 0.16 | | | | | | | | | | | | | | |
| | | J-14 | 22.0-24.1 | BP-SM | 3 | 89 | 8 | 0.09 | | | | | | | | | | | | | | |
| FD-45 | 699.5 | J-4 | 5.0-10.0 | SM-SC | 10 | 57 | 33 | 0.01 | | | | | | | | | | | | | | |
| | | J-6 | 10.5-15.0 | SM | 19 | 52 | 29 | 0.009 | | | | | | | | | | | | | | |
| | | J-12 | 25.0-30.0 | SM-SC | 12 | 54 | 34 | 0.0031 | | | | | | | | | | | | | | |
| | | J-16 | 35.0-40.0 | SM | 18 | 56 | 26 | 0.013 | | | | | | | | | | | | | | |
| FD-47 | 699.8 | J-3 | 5.5-10.0 | SM | 12 | 54 | 24 | 0.025 | | | | | | | | | | | | | | |
| | | J-7 | 15.0-18.0 | SM | 14 | 56 | 30 | 0.018 | | | | | | | | | | | | | | |
| | | J-11 | 20.0-23.0 | BP-SM | 23 | 68 | 9 | 0.10 | | | | | | | | | | | | | | |

CONANT BROOK DAM

* PROVIDENCE VIBRATED DENSITY TEST

NED FORM 510 JUL 63

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CU FT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|----------------------|-------------|----|------------------|----------------------|--------|-----------------|--------------------------|-------|-----------|----------------------------|--------|-------------|---------|-------|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ M.M. | LL | PL | | TOTAL | - NO 4 | OPT. WATER % | MAX. DRY DENS. LBS/CU FT | PVD # | LBS/CU FT | TOTAL | - NO 4 | SHEAR | CONSOL. | PERM. |
| FD-50 | 709.6 | J-3 | 2.0-5.0 | SM | 20 | 44 | 36 | 0.0051 | | | | | | | | | | | | | | |
| | | J-8 | 15.0-20.0 | SM | 18 | 54 | 28 | 0.013 | | | | | | | | | | | | | | |
| | | J-14 | 30.0-35.0 | SM | 22 | 53 | 25 | 0.015 | | | | | | | | | | | | | | |
| | | J-20 | 50.0-53.0 | SM | 14 | 59 | 27 | 0.012 | | | | | | | | | | | | | | |
| FD-55 | 642.9 | J-2 | 1.8-4.3 | SM | 16 | 61 | 23 | 0.03 | | | | | | | | | | | | | | |
| | | J-5 | 7.6-9.4 | SM | 4 | 59 | 37 | 0.007 | | | | | | | | | | | | | | |
| | | J-9 | 12.1-15.0 | SM | 11 | 53 | 36 | 0.01 | | | | | | | | | | | | | | |
| | | J-11 | 17.6-19.1 | SM | 37 | 50 | 13 | 0.05 | | | | | | | | | | | | | | |
| FD-56 | 638.8 | J-1 | 0.7-2.8 | SP-SM | 59 | 36 | 5 | 0.18 | | | | | | | | | | | | | | |
| | | J-4 | 6.2-10.0 | SM | 13 | 58 | 29 | 0.015 | | | | | | | | | | | | | | |
| | | J-8 | 15.7-18.9 | CM | 48 | 34 | 18 | 0.035 | | | | | | | | | | | | | | |
| FD-57 | 637.2 | J-4 | 10.0-15.0 | SM | 19 | 60 | 21 | 0.022 | | | | | | | | | | | | | | |
| | | J-5 | 15.0-18.2 | SM | 20 | 75 | 5 | 0.16 | | | | | | | | | | | | | | |
| FD-58 | 636.9 | J-4 | 5.0-10.0 | SM | 13 | 62 | 25 | 0.013 | | | | | | | | | | | | | | |
| | | J-7 | 12.9-15.0 | SM | 11 | 69 | 20 | 0.035 | | | | | | | | | | | | | | |
| FD-59 | 743.7 | J-2 | 5.0-7.4 | CP-CM | 45 | 45 | 10 | 0.08 | | | | | | | | | | | | | | |
| | | J-4 | 10.0-13.4 | ML | 0 | 6 | 94 | 0.007 | | | | | | | | | | | | | | |

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CU FT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|----------|-------------|----|------------------|--------------------|--------|-----------------|--------------------------|-------|-------|----------------------------|-------|-------------|-------|--|
| | | | | | GRAVEL % | SAND % | FINES % | D 10 mm. | LL | PL | | TOTAL % | - NO 4 | OPT. WATER % | MAX. DRY DENS. LBS/CU FT | PVD # | TOTAL | - NO 4 | SHEAR | CONSOL. | PERM. | |
| FT-1 | 752+ | B-3 | 2.9-16.4 | SM | 0 | 87 | 13 | | | | | TOTAL % | - NO 4 | OPT. WATER % | MAX. DRY DENS. LBS/CU FT | PVD # | TOTAL | - NO 4 | SHEAR | CONSOL. | PERM. | |
| FT-2 | 766.3 | B-2 | 2.2- 6.0 | SM | 33 | 41 | 26 | | | | | | | | | | | | | | | |
| FT-3 | 771.4 | B-3 | 4.4- 6.0 | ML | 5 | 32 | 63 | | | | | | | | | | | | | | | |

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JUL 63

* PROVIDENCE VIBRATED DENSITY TEST

CONANT BROOK DAM

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CUFT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|----------------------|-------------|------------|------------------|-----------------------------|--------|---------------------|--------------------------|-------|-----------|---------------------------|--------|-------------|--------|-------|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ M.M. | LL | PL | | TOTAL | - NO 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | LBS/CU FT | TOTAL | - NO 4 | SHEAR | CONSOL | PERM. |
| BD-1 | 819.6 | J-6 | 6.7-10.0 | SM | 12 | 62 | 26 | 0.024 | | | | 9.2 | 9.9 | | | | | | | | | |
| | | J-7 | 10.4-11.8 | SM | 6 | 62 | 32 | 0.016 | | | | | | | | | | | | | | |
| | | J-8R | 10.4-11.8 | SM | | | | | | | | | | | | | | | | | | |
| | | J-13 | 15.0-17.0 | SM | 10 | 58 | 32 | 0.011 | | | | 9.6 | 9.9 | | | | | | | | | |
| | | J-14R | 15.0-17.0 | SM | 7 | 62 | 31 | 0.015 | | | | 8.4 | 8.6 | | | | | | | | | |
| | | J-19R | 20.0-22.0 | SM | 6 | 57 | 37 | 0.008 | | | | | | | | | | | | | | |
| | | J-23 | 25.0-27.4 | SM | | | | | | | | 9.2 | 10.7 | | | | | | | | | |
| BD-2 | 803.6 | J-24R | 25.0-27.4 | SM | | | | | | | | | | | | | | | | | | |
| | | J-2 | 1.6-4.2 | SM | 26 | 57 | 17 | | | | | | | | | | | | | | | |
| | | J-5 | 5.0-8.8 | SM | 18 | 55 | 27 | 0.03 | | | | | | | | | | | | | | |
| | | J-7 | 10.0-13.0 | SM | 23 | 58 | 19 | 0.04 | | | | | | | | | | | | | | |
| | | J-9 | 13.0-15.0 | SM | 7 | 62 | 31 | 0.017 | | | | 9.5 | 11.1 | | | | | | | | | |
| | | J-10R | 13.0-15.0 | SM | | | | | | | | | | | | | | | | | | |
| | | J-16 | 21.0-22.3 | SM | 17 | 56 | 27 | 0.02 | | | | | | | | | | | | | | |
| | | J-20 | 26.0-27.6 | SM | 11 | 50 | 29 | 0.015 | | | | | | | | | | | | | | |
| | | J-21R | 26.0-27.6 | SM | | | | | | | | | | | | | | | | | | |
| | | J-25 | 35.0-38.0 | SM | 7 | 61 | 32 | 0.014 | | | | 11.8 | 13.1 | | | | | | | | | |
| BD-3 | 818.0 | J-26R | 35.0-38.0 | SM | | | | | | | | 10.3 | 12.3 | | | | | | | | | |
| | | J-32 | 45.0-46.4 | SM | 12 | 65 | 23 | 0.026 | | | | 8.8 | 9.8 | | | | | | | | | |
| | | J-34R | 45.0-46.4 | SM | | | | | | | | | | | | | | | | | | |
| | | J-3 | 5.0-6.0 | SM | 6 | 72 | 22 | 0.05 | | | | | | | | | | | | | | |
| | | J-8 | 11.7-13.7 | SM | 6 | 63 | 31 | 0.017 | | | | | | | | | | | | | | |
| | | J-9R | 11.7-13.7 | SM | | | | | | | | | | | | | | | | | | |
| | | J-15R | 19.7-20.5 | SM | 6 | 57 | 37 | 0.008 | | NonPlastic | | 8.8 | 8.9 | | | | | | | | | |
| | | J-29 | 26.0-27.1 | SM | 6 | 65 | 29 | 0.019 | | | | | | | | | | | | | | |
| | | J-20R | 26.0-27.1 | SM | | | | | | | | 10.7 | 11.0 | | | | | | | | | |
| | | J-22 | 31.0-32.5 | SM | 9 | 60 | 31 | 0.009 | | NonPlastic | | | | | | | | | | | | |
| | | J-28 | 40.0-42.0 | SM | 11 | 73 | 26 | 0.029 | | | | 9.2 | 9.4 | | | | | | | | | |
| | | J-29R | 40.0-42.0 | SM | | | | | | | | | | | | | | | | | | |

CONANT BROOK DAM

* PROVIDENCE VIBRATED DENSITY TEST

NED FORM 510 JUL 63

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CU FT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|---------------------|-------------|----|------------------|----------------------|--------|---------------------|--------------------------|-------|-----------|----------------------------|--------|-------------|--------|-------|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ MM. | LL | PL | | TOTAL | - NO 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | LBS/CU FT | TOTAL | - NO 4 | SHEAR | CONSOL | PERM. |
| BD-4 | 815.3 | J-5R | 2.1- 3.0 | SM | 13 | 57 | 30 | | | | | | | | | | | | | | | |
| | | J-9 | 10.0-12.2 | SM | 32 | 53 | 15 | | | | | | | | | | | | | | | |
| | | J-4 | 5.0- 6.4 | SM | 8 | 62 | 30 | | | | | | | | | | | | | | | |
| BD-6 | 839.3 | J-3 | 3.5- 5.0 | SM | 19 | 60 | 21 | 0.031 | | | | | | | | | | | | | | |
| | | J-7R | 7.6-10.0 | SM | 5 | 61 | 34 | 0.01 | | | | | | | | | | | | | | |
| | | J-8 | 10.0-12.0 | SM | 13 | 54 | 33 | 0.002 | | | | | | | | | | | | | | |
| | | J-10 | 15.0-17.0 | SM | | | | | | | | | | | | | | | | | | |
| | | J-11R | 15.0-17.0 | SM | | | | | | | | | | | | | | | | | | |
| BD-7 | 819.8 | J-4 | 5.0-10.0 | SM | 20 | 59 | 21 | 0.03 | | | | | | | | | | | | | | |
| | | J-5R | 5.0-10.0 | SM | 6 | 58 | 36 | 0.007 | | | | | | | | | | | | | | |
| | | J-9 | 15.0-17.0 | SM | 7 | 62 | 31 | 0.015 | | | | | | | | | | | | | | |
| | | J-10R | 15.0-17.0 | SM | | | | | | | | | | | | | | | | | | |
| | | J-13 | 25.0-26.4 | SM | | | | | | | | | | | | | | | | | | |
| | | J-14R | 25.0-26.4 | SM | | | | | | | | | | | | | | | | | | |
| | | J-17R | 30.0-33.0 | SM | 3 | 61 | 36 | 0.004 | | | | | | | | | | | | | | |
| BD-8 | 828.6 | J-20 | 40.0-42.3 | SM | | | | | | | | | | | | | | | | | | |
| | | J-6 | 5.5- 8.0 | SM | 7 | 59 | 34 | 0.008 | | | | | | | | | | | | | | |
| | | J-7R | 5.5- 8.0 | SM | 3 | 58 | 39 | 0.006 | | | | | | | | | | | | | | |
| | | J-12 | 15.0-16.3 | SM | | | | | | | | | | | | | | | | | | |
| | | J-13R | 15.0-16.3 | SM | | | | | | | | | | | | | | | | | | |

SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CU FT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|----------------------|-------------|----|------------------|-----------------------------|--------|---------------------|--------------------------|-------|-----------|----------------------------|--------|-------------|--------|-------|
| | | | | | GRAVEL % | SAND % | FINES % | D ₁₀ M.M. | LL | PL | | TOTAL | - NO 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | LBS/CU FT | TOTAL | - NO 4 | SHEAR | CONSOL | PERM. |
| ED-9 | 790+ | J-3R | 1.8- 5.0 | SM-SM | 13 | 76 | 11 | 0.068 | | | | | | | | | | | | | | |
| | | J-5R | 5.0- 9.0 | SM | 14 | 72 | 14 | 0.058 | | | | | | | | | | | | | | |
| | | J-7R | 10.0-12.4 | SM | 15 | 59 | 26 | 0.03 | | | | | | | | | | | | | | |
| | | J-8R | 10.0-12.4 | SM | | | | | | | | 6.7 | 9.9 | | | | | | | | | |
| | | J-12 | 15.0-16.0 | SM | 7 | 63 | 30 | 0.012 | | | | | | | | | | | | | | |
| | | J-13 | 15.0-16.0 | SM | | | | | | | | | | | | | | | | | | |
| | | J-16 | 25.0-27.0 | SM | 8 | 61 | 31 | 0.011 | | | | 9.2 | 10.1 | | | | | | | | | |
| | | J-19 | 30.0-32.0 | SM | | | | | | | | 9.4 | 9.6 | | | | | | | | | |
| | | J-22 | 40.0-43.0 | SM | 9 | 62 | 29 | 0.017 | | | | | | | | | | | | | | |
| | | J-23 | 40.0-43.0 | SM | | | | | | | | 7.2 | 7.5 | | | | | | | | | |

CONANT BROOK DAM

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SOIL TESTS RESULTS

| EXPL. NO. | TOP ELEV. FT. | SAMPLE NO. | DEPTH FT. | SOIL SYMBOL | MECHANICAL ANALYSIS | | | | ATT. LIMITS | | SPECIFIC GRAVITY | NAT. WATER CONTENT % DRY WT | | COMPACTION DATA | | | | NAT. DRY DENSITY LBS/CU FT | | OTHER TESTS | | |
|-----------|---------------|------------|-----------|-------------|---------------------|--------|---------|----------|-------------|------|------------------|-----------------------------|---------|---------------------|--------------------------|-------|-------|----------------------------|-------|-------------|-------|--|
| | | | | | GRAVEL % | SAND % | FINES % | D 10 mm. | LL | PL | | TOTAL | - NO. 4 | OPT. WATER % DRY WT | MAX. DRY DENS. LBS/CU FT | PVD # | TOTAL | - NO. 4 | SHEAR | CONSOL. | PERM. | |
| BTT-1 | 830.0 | J-3R | 3.1- 6.6 | SM | 9 | 62 | 29 | 0.016 | NonPlastic | | | 11.7 | 13.0 | 10.5 | 125.8 | | 126.5 | | | X | | |
| | | J-3R | 3.1- 6.6 | | | | | | | | | 11.5 | 12.8 | | | | | | | | | |
| | | B-4 | 3.1- 6.6 | | | | | | | | | 9.8 | | | | | | | | | | |
| | | UC-5A | 3.1- 6.6 | | | | | | | | | 11.2 | | | | | | | | | | |
| | | UC-5B | 3.1- 6.6 | | | | | | | | | 10.9 | | | | | | | | | | |
| | | UC-5C | 3.1- 6.6 | | | | | | | | | 12.1 | 13.6 | | | | | | | | | |
| | | J-6R | 6.6-11.0 | | | | | | | | | 11.4 | 13.6 | | | | | | | | | |
| | | J-6R | 6.6-11.0 | | | | | | | | | 9.8 | 119.4 | | | | | | | | | |
| | | B-7 | 6.6-11.0 | | | | | | | | | 10.3 | 11.1 | | | | | | | | | |
| | | J-8R | 11.0-15.5 | | | | | | | | | 10.8 | 11.4 | | | | | | | | | |
| | | B-10 | 11.0-15.5 | SM | 9 | 62 | 29 | 0.018 | NonPlastic | 2.75 | 11.4 | | 10.5 | 123.7 | | 129.9 | | X | | | | |
| | | UC-9A | 11.0-15.5 | | | | | | | | 8.3 | | | | | | | | | | | |
| | | UC-9B | 11.0-15.5 | | | | | | | | 8.6 | | | | | | | | | | | |
| | | UC-9C | 11.0-15.5 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

SECTION 1

PREPARATION OF SITE (Item 1)

(INDEX)

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SECTION 1

PREPARATION OF SITE

(Item 1)

1-01. SCOPE. - Work covered by this section of the specifications consists in furnishing all plant, labor, equipment, and appliances and in performing all operations in connection with the clearing and grubbing, and structure removal at various sites of the work, including the dam, dike, and the highway relocations and improvements, except the borrow area, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

1-02. REMOVAL OF EXISTING STRUCTURES. - a. General. - Within the limits of clearing and except as specifically covered under other sections, the contractor shall remove all structures, wood and wire fences, above-ground stone walls and rock piles, and existing underground piping, culverts, utilities, and appurtenant structures. Beyond the limits of clearing, the contractor shall remove the structures over the two indicated water supply wells to be abandoned, shall seal and plug the open pipe ends with concrete, shall fill the wells, and shall remove portions of the existing cast iron water line to the limits hereinafter specified. The contractor shall, as hereinafter specified, fill all cellars, basements, cisterns, wells, etc., and shall backfill all excavations due to the removal of underground pipes, utilities, and structures.

(1) The term "structures" shall include buildings, or portions thereof, walls, septic tanks, leaching cesspools, cellars, wells, etc. Structures shall be removed or filled to ground surfaces, as applicable, except that in areas to be graded or topsoiled and seeded, concrete and masonry shall be removed to at least 12 inches below finished grade.

(2) All existing septic tanks, leaching cesspools, underground storage tanks, etc., within the limits of clearing shall be removed and resulting holes filled, as specified below. The contractor shall investigate and determine if any such items are required to be removed.

(3) All fills and backfills as required due to removal of existing structures occurring within limits of foundation fill areas shall consist of material similar to adjacent embankment fill material, and all costs in connection with excavation, filling and backfilling will be paid for in accordance with the applicable earthwork sections of the Technical Provisions.

(4) All fills and backfills as required due to removal of existing structures and occurring outside the limits of foundation fill areas shall be accomplished using suitable approved material including broken concrete and masonry, well compacted so that little settlement will result, and top earth fill so graded so that final finished grades will be continuous with adjacent contours of the general terrain.

b. Removal of C.I. Water Pipe. - The contractor shall be required to remove the existing 12-inch cast iron water main beneath the dam embankment and to a distance of approximately 10 feet beyond the toes of the dam. Since the exact location and depth of the pipe is not definite, the contractor shall not commence any removal operations until he has excavated the foundation cut-off and drainage trenches and has clearly located the pipe and determined its line and grade. Excavation for pipe removal shall not begin until excavation for the dam embankment foundation in the above area has been completed. Within other areas, the pipe need not be removed; however, all open ends shall be securely sealed and plugged with concrete to a minimum depth of 12 inches or with approved type plugs.

c. Disposal. - The structures and other items removed shall become the property of the contractor. Combustible material shall be disposed of as specified in Paragraph 1-03d. "Disposal". Non-combustible materials not suitable or permitted for use as fill shall be wasted in off-site contractors disposal areas.

1-03. CLEARING AND GRUBBING. - a. General. - Clearing shall consist of the satisfactory felling and removal of all trees and vegetation (except grass) together with down timber, snags, brush and rubbish and other objectionable material and vegetation other than grass and leaves from the areas specified, and occurring within the limits of the areas to be cleared. Grubbing shall consist of the below ground removal and disposal of all stumps, natural growth, and buried logs, from areas specified.

b. Clearing. - The areas to be cleared shall include all existing uncleared areas at the site of all new permanent works, excavated, filled and graded areas, and spoil areas, together with a 10-foot strip measured horizontally beyond and contiguous thereto for the foundation areas for dam, dike, and access road to dam embankment, a 10-foot strip for dam, dike, spillway, and access road, measured horizontally beyond and contiguous thereto for all cut sections for dam, dike and access road, and as required for the log boom, and as otherwise required and to the limits as shown on the drawings. Where grubbing is not specified, stumps shall be left not more than 6 inches higher than the existing ground, except as specified in Section 3 relative to clearing in spoil areas. In areas of road relocations and in pavements, do not clear beyond top of cuts or toe of fills.

c. Grubbing. - The areas to be grubbed include the foundation areas for the dam and dike embankments, the foundation areas for the highway embankments as hereinafter specified, and the areas for all cuts. The areas of fill for the highway work shall be grubbed when the areas of fill measured from subgrade is 3 feet or less. Also included in areas to be grubbed are the areas of a strip 10 feet wide to be measured horizontally and contiguous to the described areas of the dam, dike and access road, to be grubbed, and areas of a strip 10 feet wide to be measured horizontally and contiguous to the limits of all cut sections of the dam, dike, spillway, and access road. In grubbing out stumps, all tap and lateral roots or other growth over 1-1/2 inches in diameter shall be removed to a depth of 1-1/2 feet below the stripping line in areas to be stripped and to a depth of 1 foot below the ground surface in grubbing areas not to be stripped. In stripping areas within previously wooded areas, as determined by the Contracting Officer, roots with a diameter greater than 1/2-inch shall be removed for a depth of 8 inches by the use of an approved root raker or scarifier after the stripping operations are completed. The rooting or scarifying operations shall be repeated as often as considered necessary by the Contracting Officer to insure satisfactory removal of roots. After each operation, exposed roots on the surface shall be removed prior to the succeeding operation.

d. Disposal. - All materials removed during the clearing and grubbing operations shall be disposed of by burning or removal to approved disposal areas outside of the reservoir area, unless otherwise authorized, except that merchantable timber shall become the property of the contractor and shall be removed from the site of the work. No material shall be thrown into or left along the banks of the river. The disposal of material shall closely follow the removal thereof so that in case of high water a minimum of debris and brush will be washed downstream. At no time shall such material be placed on land outside the work areas. The contractor shall be responsible for compliance with all Federal and State Laws and regulations relative to the building of fires. Disposal by burning shall be under constant attendance until fires have burned out or have been extinguished. Whenever elm trees are cut, all portions of the trees which are neither buried as directed or burned shall be thoroughly sprayed with a two percent emulsion of DDT.

1-04. LOWERING WATER SERVICE. - The service line to be lowered is indicated on the plans. The contractor's obligations shall consist of excavating and exposing the existing service line. Excavation in the vicinity of the pipe, including the undercut area provided for lowering the line to the depth specified, shall be done by hand shovel. The actual lowering of the service line shall be accomplished by the town of Monson Water Department which will supply all the pipe fittings and any additional material necessary to lower the line. The backfilling and compaction of

the trench shall be done by the contractor as specified in Section 11, EXCAVATION, TRENCHING AND BACKFILLING FOR PIPE CULVERTS AND DRAINS, for the excavation and backfilling for culverts and drains other than the three large culverts.

1-05. PLUGGING THE EXISTING WATER MAIN. - The plugging of the existing water main near Wales Road which will remain in operation along with excavation, compaction, and backfilling therefor shall be done by and at the expense of the town of Monson Water Department. The contractor shall coordinate all work on the existing mains with the town's water department.

1-06. REMOVAL OF DEBRIS FROM EXISTING CULVERTS. - The existing 48" x 46" C.M.P. culvert leading to the new 54" culvert and the existing culvert in the vicinity of the East Hill Road turn-around shall be cleaned of all debris. The entrance and discharge areas shall be cleaned up and shaped to provide an efficient flow condition. See Paragraph 12-06.

1-07. PAYMENT. - a. Except as noted below, payment for all work in connection with the preparation of the various sites of the work as specified above will be made at the contract lump sum price for Item 1, "Preparation of Site". The lump sum price for this item shall reflect the salvage value of the merchantable timber and structures to be removed.

b. Payment for filling holes due to removal of stumps and for filling and backfilling due to removal of existing structures occurring within limits of embankment foundation areas will be paid for at the applicable contract unit priced for the materials used. Payment for the excavation required due to removal of the existing cast iron water line occurring within the limits of embankment foundation area of dam will be paid for at the contract unit price for Item 3, "Unclassified Excavation - General."

SECTION 2
CONTROL AND DIVERSION OF WATER
(Item 2)
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SECTION 2

CONTROL AND DIVERSION OF WATER (Item 2)

2-01. SCOPE. - a. The work covered by this section of the specifications consists in furnishing all plant, labor and appliances, and in performing all operations in connection with diverting and controlling the Conant Brook in connection with the construction of the dam and the 54-inch, 15-foot and 17-foot culverts, dewatering the construction areas within the limits of applicable permanent works and structures, so that these structures may be constructed in the dry, all in accordance with this section of the specifications. The work under this section shall also include all pumping, dewatering and drainage for lowering the ground water table so that the work as specified above and in other sections can be constructed in the dry.

b. All other requirements relative to control and diversion of water are specified and included under the applicable excavation sections of the Technical Provisions.

2-02. DAM. - a. Diversion. - (1) The contractor shall initiate and complete the outlet works including the conduit prior to any diversion. Paragraph SC-61 covers restrictions as to when the outlet works and other items of work can be performed, and these restrictions are in addition to those hereinafter stated.

(2) When the relocation of Wales Road is substantially completed and when traffic over existing Wales Road has been discontinued and when the existing utility lines on Wales Road have been removed by others, and when the new water supply system has been completed, and when so notified in writing by the Contracting Officer, the contractor shall complete the outlet works and divert the brook through the outlet works by constructing upstream and downstream cofferdams.

b. Existing Monson Reservoir. - The contractor shall make his own arrangements with local authorities relative to lowering of the existing reservoir during his construction of the dam and appurtenances. All cofferdams built within the existing reservoir shall be removed when no longer required to return reservoir to its original capacity.

c. Cofferdams. - The contractor may select any plan for diversion which will permit excavation for the dam embankment, trenches in dam embankment, foundation, grouting, and construction of the structures including the embankment in the dry. In order to place the dam embankment materials in the dry, temporary upstream and downstream cofferdams shall be required. These cofferdams shall be located outside the limits of the permanent structure. The contractor shall select the location, type of construction and height of these cofferdams. Any damage to new and permanent work resulting from flooding due to overtopping or other failure of cofferdams shall be repaired by the contractor

and at no additional cost to the Government. If considered satisfactory by the contractor, excess materials from required excavations and materials designated as spoil may be used in construction of cofferdams. All materials placed in the cofferdams shall be removed prior to completion of the work and placed in spoil areas.

2-03. THREE LARGE CULVERTS. - All streams which may interfere with the proper construction of the 54-inch, 15-foot and 17-foot culverts and appurtenant items shall be controlled and/or diverted as required in order to perform the work specified in other sections. No excavation or diversion will be permitted close enough to a culvert excavation to interfere with the specified width of pipe bedding and culvert backfill.

2-04. PAYMENT. - a. The contract lump sum price for Item 2, "Control and Diversion of Water" shall include payment for control, diversion and care of the brook during construction; the construction, maintenance and removal of cofferdams, including the rebuilding of cofferdams in case of destruction by flood.

b. The contract price under Subparagraph 2-03a. above shall also include the costs for all pumping, drainage and dewatering necessary to obtain and maintain in a dry condition all excavation and work areas, and, in connection with the dam and culverts shall also include the maintenance of unobstructed flow prior to diversion, and through diversion channels during the remaining period of the contract. The lump sum price for Item No. 2 shall also include all costs in connection with the requirements for lowering the water table and dewatering during the construction of the dam foundation cut-off and drainage trenches and other trenches.

c. Estimates for partial payments for this work for the dam will be as follows: Ten percent of the contract price when all work in connection with control and diversion of water for the three large culverts is completed; forty percent of the contract price when the brook has been diverted and all cofferdams for the dam construction have been constructed as specified; forty percent of the contract price when the entire working area for the dam has been unwatered and the embankment completed to elevation 760.0; and ten percent of the contract price and when all cofferdams have been disposed of as specified.

SECTION 3
EXCAVATION
(Items 3, 4, 5 and 7)

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SECTION 3

EXCAVATION

(Items 3, 4, 5 and 7)

3-01. SCOPE. - a. The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, and appliances, and of performing all operations in connection with all excavations (including excavation for the removal of the existing 12-inch cast iron water main in the foundation area of the dam embankment) and cleaning of bedrock surfaces, except as noted below, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract. This section of the specifications does not cover excavations for (1) bubble gage shelter (2) the removal of temporary cofferdams (3) drains and culverts except for the 54", 15' and 17' culverts, and (4) miscellaneous excavations which are covered under other sections of the specifications.

b. The term "required excavation" as used in this section is defined as any or all excavations covered in this section other than those in the borrow area.

3-02. GENERAL PROVISIONS. - a. Utilization of Materials. - All excavated materials shall be satisfactorily disposed of as directed. With the exception of unsuitable materials, stripping materials not utilized for production of topsoil, and materials designated herein as spoil, all other excavated material shall be used to the extent possible in the permanent works. Earth material from the required excavations for the construction of the foundation drain between approximately Sta. 5+00 and Sta. 6+00, for the foundation cut-off between approximately Sta. 5+50 and Sta. 8+00, for the removal of the existing 12 inch cast iron water main in the foundation area of the dam embankment, and for the spillway channel between approximately Sta. 14+00 and Sta. 15+00 are designated as spoil. Only materials unsuitable for use in the construction of embankments, including highway embankments, excess materials, and materials designated as spoil may be used in the construction of cofferdams. The Contracting Officer shall be the sole judge as to the suitability of all materials. Materials shall not be spoiled unless specifically authorized or stated herein. Materials from required excavations and the borrow area shall be utilized in the permanent work as specified in other sections of these specifications. The contractor shall conduct the work in a manner to utilize all suitable materials from the required excavations in the permanent work with the exceptions described above. To insure the greatest possible use of materials from required excavations without stockpiling, all required excavations for the project (except stripping and those excavations listed above from which the earth materials are designated as spoil) shall be deferred until such time as the materials from these excavations can be used for the construction of embankments and other fills unless the contractor elects to stockpile these materials at his own expense.

b. Disposal of Excess and Unsuitable Materials. - Excess and unsuitable material from required and borrow excavations shall be spoiled only when specifically authorized. All materials which are authorized to be spoiled shall be disposed of in the spoil areas shown on the drawings and in excavated portions of the borrow areas designated by the Contracting Officer as spoil areas. Prior to placement of materials, the foundation areas of all spoil areas shall be cleared of all standing timber leaving no stumps higher than 3 feet above the adjacent ground surface and the material thus obtained shall be disposed of as specified in Section 1, PREPARATION OF SITE for materials obtained from other clearing operations. Spoil materials shall be placed to the lines and grades shown on the drawings or as directed. All spoil areas shall be graded to the final limits shown on the drawings or as directed so as to provide slightly and smooth surfaces sloped for suitable drainage. All spoil areas unless otherwise shown on the drawings shall be seeded and mulched as specified in Section 17, TOPSOILING, SEEDING, AND MULCHING.

c. Stockpiling. - The contractor shall stockpile stripping materials required for the production of topsoil and materials from required rock excavations for processing for rock slope protection materials as required for the execution of the work. In addition, the contractor may stockpile other materials for his own convenience subject to prior approval. All materials to be stockpiled shall be placed in approved stockpile areas which have been cleared, grubbed and graded. Stockpiles of impervious fill and random fill materials shall be located in approved well drained areas and the surfaces of the stockpiles at all times shall be graded for drainage and rolled so as to be smooth and relatively watertight. Stockpiles of materials from required rock excavations shall be maintained free of earth and shall be constructed in layers in such a manner as to prevent segregation. No rock slope protection material shall be stockpiled after grizzlying. No separate payment will be made for the placement of materials in stockpiles or their excavation therefrom, for the grading of stockpile areas before placement and after removal of the materials. Payment for all work in connection with stockpiling materials under this contract shall be included in the contract unit price per cubic yard for the excavation of the materials from their original sources. Stockpiled materials in excess of the quantity used in the permanent work shall be removed and placed in designated spoil areas unless the stockpile area is approved as a spoil area.

d. Shoring and Sheeting. - The contractor shall be responsible for the unfinished work, and for the safety of workmen from danger of caving and slides unless otherwise specified. Shoring and sheeting may be used at the option of the contractor, except that if considered necessary and the contractor does not use them, their use will be ordered at no additional cost to the Government. Shoring and sheeting shall not be used for excavations which are to be filled or backfilled with compacted materials unless specifically authorized. Shoring and sheeting shall be erected in a safe and workmanlike manner, in accordance with the requirements of the Corps of Engineers Manual, "General Safety Requirements",

and shall be placed in such a way as to afford an ample clearance for ready inspection of permanent work. Shoring and sheeting shall be removed upon completion of the permanent work as soon as the construction does not require its use. Where shoring and sheeting are used in lieu of excavations to full dimensions of the pay lines, measurement will be taken to the payment lines as shown on the drawings.

e. Temporary Drains, Pumping and Unwatering. - The contractor shall maintain the sites of work and adjacent grounds in a well-drained condition. Temporary drains, cofferdams, and ditches required shall be constructed by the contractor at no additional expense to the Government. The contractor shall provide all necessary equipment and material, and shall unwater and maintain in a dry condition the foundation areas for the various features of work to the extent required by the provisions in this and other sections of the specifications for excavation, preparation of foundation, grouting, placement of fill and backfill and for the construction of drains, culverts, and concrete structures for the dam, dike, and roads. All cofferdams shall be removed to the satisfaction of the Contracting Officer. Payment for pumping, unwatering, and lowering the ground water table for various features shall be included in applicable payments for excavations of materials, except as provided in Section 2, CONTROL AND DIVERSION OF WATER of these specifications.

f. Stones in Excavations. - Boulders and stones will be encountered during unclassified excavation. Boulders and stone encountered in required excavations shall be disposed of as directed. Stones and boulders shall be removed from random and impervious fill materials prior to compaction and shall be utilized in rock slope protection layers as specified in Section 5, EMBANKMENTS, DAM AND DIKE and Section 6 ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL, of these specifications. Stones and boulders removed from material during borrow excavation shall be disposed of within the excavated portions of the borrow area in an approved manner to form sightly piles.

g. Salvage of Stripping Material for Topsoil. - To the extent required, portions of stripping material shall be processed for topsoil in accordance with Section 17, TOPSOILING, SEEDING, AND MULCHING, of these specifications.

3-03. CLASSIFICATION. - Except as otherwise prescribed, excavations will be classified as follows:

a. Unclassified Excavation. - Unclassified excavation shall comprise the satisfactory removal of all materials including those removed with the aid of drilling and blasting, except the materials removed as rock excavation and defined in Subparagraph b below.

b. Rock Excavation. - Rock excavation shall consist of the satisfactory removal of the following:

(1) Boulders or rock blocks detached from bedrock measuring 2 cubic yards or more in volume.

(2) Bedrock which, as determined by the Contracting Officer, can be removed only by systematic and continuous drilling and blasting. Where material is encountered for which the contractor claims classification as rock excavation for its removal, the material shall be uncovered and exposed and the Contracting Officer notified before proceeding with its excavation. The contractor shall not proceed with the excavation of such material until it has been cross-sectioned and classified by the Contracting Officer. Failure on the part of the contractor to uncover and expose such material, to notify the Contracting Officer, and allow time for cross-sectioning the undisturbed surface of such material will forfeit the contractor's right of claim to any classification other than that allowed by the Contracting Officer for the areas of work in which such materials occur.

c. Stripping. - Stripping shall consist of the removal of surficial materials judged by the Contracting Officer to be unsatisfactory for use as foundation materials or for the use in the construction of fills which materials shall include sod, topsoil, stones, buried drains, existing foundations, swamp deposits, organic materials, artificial fills, road pavements, base courses for pavements, all loose rock and boulders on the surface, and other materials judged by the Contracting Officer as objectionable. Stripping shall be unclassified excavation except for the removal of boulders or detached rock blocks measuring 2 cubic yards or more in volume which will be rock excavation.

3-04. UNCLASSIFIED EXCAVATION, GENERAL. - a. General. - Unclassified excavation, general, shall consist of the satisfactory removal, hauling to project features, hauling to and placement in spoil areas and hauling to, placement in and rehandling from stockpiles of material removed by unclassified excavation from within the lines, grades, and slopes of all project work as shown on the drawings or as modified in the field by the Contracting Officer, except materials excavated from the borrow areas or as otherwise specified in Section 1, PREPARATION OF SITE. All excess and unsuitable materials removed by unclassified excavation, general, shall be disposed of in the spoil areas as specified in Paragraph 3-02. The sequence of operations, to insure the maximum utilization of materials from required excavations, shall be as specified in Paragraph 3-02 above.

b. Stripping. - Stripping shall be performed within the areas shown on the drawings and shall be limited in depth so as to remove only those surficial materials considered to be unsatisfactory for embankment fill material or unsuitable as a foundation material. Stripping operations shall be performed in such a manner as to salvage materials acceptable for processing for topsoil to the extent required as specified in Section 17, TOPSOILING, SEEDING AND MULCHING. Only natural surface soil containing humus material shall be stockpiled. The Contracting Officer shall guide and control the extent and final depth of stripping and may direct the contractor to strip to limits and depths different from those shown on the drawings at no change in the contract unit prices.

c. Grading. - Roads, highways, turnarounds, parking areas and other required areas shall be graded in accordance with the sections indicated on the drawings. Shoulders, ditches, side slopes, subgrades, and other designated areas shall be trimmed and dressed in a neat and workman-like manner to the lines and grades shown on the drawings or staked in the field.

d. Trenches in Dam Embankment Foundation. - (1) Trenches excavated in the dam embankment foundation area for the construction of the foundation drain and foundation cut-off shall be excavated to the bottom widths, depths, and limits shown on the drawings except as otherwise specified herein. In reaches of trench where excavation to bedrock is indicated on the drawings and where bedrock is encountered at a grade below that indicated, the contractor shall widen the excavation to the full bottom width shown on the drawings by adjusting the downstream limits of the trench. Excavation of the trench for the foundation cut-off shall be performed in a manner that will permit the placement and compaction of impervious fill material in reaches of at least 200 feet in length.

(2) The trench excavated in the foundation area of the dam embankment for the removal of the existing 12-inch cast iron water main shall be excavated to the depth of the invert of the pipe and to the bottom width and limits indicated on the drawings. Prior to excavation of the full length of the trench the contractor shall confirm the location of the pipe as shown on the drawings by means of test pits unless the pipe has been previously encountered in the excavations for the foundation cut-off and drainage trenches. Excavation of the trench shall be performed in a manner that will permit the placement of compacted fill material in reaches of at least 200 feet in length.

(3) The contractor shall be responsible for providing adequate means and provisions for completely dewatering the trench excavations for the entire reaches in which foundation preparation, grouting, and placement of compacted fill or backfill is being accomplished. The contractor shall also be responsible for producing and maintaining stable side slopes excavated to the lines shown on the drawings or specified herein.

3-05. CLEANING OF BEDROCK SURFACES. - a. General. - The preparation of rock surfaces against which concrete is to be placed is specified in Section 9, CONCRETE. Bedrock surfaces in excavations for the dam conduit against which gravel fill or backfill is to be placed shall be cleaned of all dirt and loose displaced rock immediately prior to the placement of the gravel fill or backfill. The excavation at, and cleaning of, other designated bedrock surfaces shall be in accordance with the provisions in the following subparagraphs. Areas other than those designated on the drawings shall be cleaned as directed. All excavation required for the cleaning and preparation of the surfaces shall be paid for at the applicable contract unit prices for Item 3, "Unclassified Excavation - General", and Item 5, "Rock Excavation". In addition, payment for cleaning shall be made as stated elsewhere in this section.

b. Machine Cleaned. - Areas of natural rock surfaces within limits of the foundation of the dam embankment as designated on the drawings shall be machine cleaned. Machine cleaning shall consist of the removal of all earth and loose rock and rock fragments from the entire bedrock surface including areas of depression, large crevices, and large open joints. The material need not be removed in areas where the horizontal width of the openings are less than 16 inches. The degree of cleaning shall at least be equivalent to that obtainable with a toothless one-quarter yard backhoe dipper after the material has been loosened by prior operations. No rock excavation will be required to remove overhangs.

c. Hand Cleaned. - All areas of rock surfaces thus indicated on the drawings shall be "hand cleaned". Those portions of the areas where the concrete of the structures will be in contact with the rock shall not be "hand cleaned", but shall be prepared in accordance with provisions of Section 9, CONCRETE. Hand cleaning of natural bedrock surfaces and rock surfaces produced by rock excavations shall consist of the removal of all earth, disintegrated bedrock, semi-detached or detached rock blocks and rock fragments from the entire bedrock surfaces including areas of depressions, crevices and joints. The bedrock surface shall be cleaned by washing or sweeping. In addition, all cracks, joints and crevices in the bedrock surfaces shall be thoroughly cleaned by use of jets of air or water or a combination thereof to the satisfaction of the Contracting Officer immediately prior to the filling of these openings with mortar in areas to be covered with impervious or random fill or impervious backfill as specified in Section 5, EMBANKMENTS - DAM AND DIKE. Hand-cleaning shall be accomplished after the special rock excavation at the surface as specified in Paragraph 3-07 has been done.

3-06. UNCLASSIFIED EXCAVATION, BORROW. - a. General. - Unclassified excavation, borrow, shall consist of the satisfactory removal, hauling to the project features, hauling to and placement in stockpiles and spoil areas of materials excavated from the borrow area and removed by unclassified excavation as defined in Paragraph 3-03 of these specifications. Materials shall be excavated from the designated borrow area to the extent required to obtain suitable impervious and random fill materials. The Contracting Officer shall guide and control the stripping, removal of unsatisfactory surface materials, depths of excavation and the selection of material in the borrow areas to obtain material meeting the specified requirements. Boulders and oversize stones removed during excavation shall be disposed of as specified in Subparagraph 3-02f. Unless specifically authorized by the Contracting Officer or shown on the drawings, excavations shall not extend below Elev. 771 or the bedrock surface, whichever is higher.

b. Clearing and Stripping. - Part 1 and Part 2 of the borrow area shall be cleared to within 25 feet beyond the limits of excavation except as otherwise directed. Part 3 of the borrow area shall be cleared when and if the Contracting Officer determines that the use of Part 3 is necessary. All clearing operations shall be as specified in Section 1, PREPARATION OF SITE for clearing operation at other locations.

The borrow areas shall be stripped only within the area of the limits of actual excavation. Stripping shall be extended only to the depth required to remove sod, forest debris, humus material containing numerous small roots, all as directed. The depth of stripping shall not be extended in order to remove occasional or large roots which can be removed during placement of the fill materials. All stripping material containing humus and organic material shall be salvaged and stockpiled for use in the borrow areas as specified in subparagraph e below.

c. Drainage. - Prior to the start of borrow excavations, the contractor shall construct ditches and embankments along the limits of excavations to prevent surface water from entering into the area of excavation. Additional drainage facilities shall be constructed in the excavation areas to channel subsurface and rain water from areas of excavation operations. All operations in connection with drainage, including the filling of temporary ditches, shall be subject to the approval of the Contracting Officer, and, if not considered adequate by the Contracting Officer, additional facilities shall be provided. Permanent interceptor ditches shall be constructed along the top of slopes and elsewhere at locations directed by the Contracting Officer. The depths, excavation slopes and exact locations of the permanent ditches shall be as directed in the field. Materials from these ditches shall be spoiled between the ditch and the excavation areas unless otherwise directed.

d. Grading. - The contractor shall grade all excavated portions of the borrow area so as to maintain these portions free of water during and after excavation. Where bedrock is not exposed during borrow excavations, the excavations will be performed in such a manner as to leave earth side slopes no steeper than 1 vertical to 3 horizontal. Upon completion of excavation operations in the borrow area, its surface shall be graded so as to leave reasonably uniform 1 on 3 earth slopes and a neat bottom surface. The finished bottom of the excavation shall be uniformly graded to the satisfaction of the Contracting Officer and shall be approximately horizontal with grades to provide drainage no steeper than 10 percent. Bedrock surfaces exposed during borrow excavations shall be cleaned to the extent feasible with bulldozers. The final earth excavation slopes shall be trimmed or graded with a bulldozer or similar equipment to provide finished slopes composed entirely of undisturbed natural soil. Filling on the slopes shall be limited to that required to fill erosion areas immediately prior to the spreading of stripping material thereon.

e. Placing Stripping Materials. - Stripping material containing humus and organic material, stockpiled as specified in Subparagraph b above, shall be spread to a loose thickness of at least 8 inches on excavation slopes and in the bottom of the borrow area, except that spreading of stripping material on extensive areas of bedrock surfaces will not be required. All of the stockpiled stripping material from the borrow area shall be spread on either the excavated slopes or on the

bottom surface of the borrow area. All material which will interfere with placement, spreading and seeding operations shall be removed from the stripping material and disposed of as required for clearing. Fine grading of spread stripping material will not be required; however, immediately prior to seeding, the spread stripping material shall be regraded to form a smooth even surface, free of gullies and eroded areas. The spread stripping material shall be compacted by two coverages of the tread of a crawler type tractor. Stripping material, spread and otherwise treated as specified above, shall be fertilized, seeded and mulched as specified in Section 17, TOPSOILING, SEEDING AND MULCHING.

f. Sequence of Operations. - Approximate depth ranges of imper-vious and random fill materials in the borrow area are shown on the drawings. All operations shall be scheduled so that the construction of the embankments and highway fills may proceed in accordance with the provisions of Section 5, EMBANKMENTS - DAM AND DIKE and Section 5A, HIGHWAY FILL. The sequence of stripping and excavation operations in the borrow area shall be such that stockpiles and spoil piles can be placed within the excavated portions of the borrow area. Initial borrow excavations will be restricted to that portion of the borrow area designated on the drawings as Part 1. Excavation will be extended into Part 2 only when, in the opinion of the Contracting Officer, all random fill material from Part 1 has been removed and replaced in the highway fills or in the random fill zone of the dam embankment. Excavation will be extended into Part 3 only when, in the opinion of the Contracting Officer, its use is required to obtain the required quantities of materials.

3-07. ROCK EXCAVATION. - a. General. - The contractor shall perform rock excavation required for the permanent work, to the lines and grades shown on the drawings or as otherwise directed. The contractor shall mark the edge of rock cut with paint or other suitable means to an accuracy of 1-inch + from the theoretical line of drilling prior to drilling operations. Excavation to lines and grades other than those shown on the drawings will be directed in writing. In areas of rock excavation where the rock is to be grizzlyed and used in the permanent work, the rock surface including the required width of berms shall be cleaned by bulldozer or other standard excavating equipment prior to rock excavation. All berms on the rock surface shall be maintained and the surface kept clean throughout construction to completion of the project. Precautions shall be taken to insure the safety of personnel from hazards of rock falls or rock slides.

b. Blasting Procedures. - The contractor shall submit for approval a separate plan of operations for the removal of rock in the spillway, conduit, and intake and outlet channels. The submittals shall be made in triplicate and shall describe the proposed methods with variations in procedures together with sketches indicating bench depths,

number, location, diameter, depth, and inclination of holes, amount, type and strength of explosives per hole and per blast, sequence and delays in firing, stemming, and any other data which the Contracting Officer may deem pertinent to his consideration for approval. Approval of the plans will not relieve the contractor of his responsibility in connection with damage resulting from blasting operations. As part of his approval for each plan, the Contracting Officer will designate an area of exploratory rock excavation to which the contractor shall confine his first drilling and blasting operation. After the first blasting operation, all fragments shall be removed and the faces cleaned for examination by the Contracting Officer. No additional drilling or blasting shall be performed until the examination has been completed and the original plan of operations re-affirmed or revised in writing. Additional changes in approved plans will be made when required as outlined below.

c. Final Grades and Excavation Lines. - From observations of the breaking characteristics of the rock as the excavation progresses, the charges used in blasting and the loading and spacing of holes may be revised, as necessary, to prevent overbreak and shattering of rock outside the design lines or grades. The intent is to limit the blasting so as to break the rock to the lines and grades shown on the drawings and yet not fracture the rock, open incipient fractures, enlarge existing fractures, make the excavation unduly large or irregular, or cause other damage outside the prescribed limits of excavation. When, in the opinion of the Contracting Officer, damage is being done to the rock at the prescribed limits of excavation, the contractor will be required to revise his drilling and blasting procedure to obtain sound slopes and grade lines and such revisions, if necessary, shall include the drilling of holes as closely spaced as 24 inches at no additional cost to the Government. In excavations over 15 feet and up to 45 feet in depth, no hole for blasting shall be drilled more than two-thirds the depth of proposed excavation. In excavations over 45 feet in depth no hole for blasting shall be drilled more than 30 feet without written approval. As excavations approach final lines and grades, the depth of holes for blasting and the amount of explosives shall be reduced progressively. Whenever, in the opinion of the Contracting Officer, blasting to grade or lines may damage the rock against which concrete is to be placed, excavation within 1 foot of design lines and grades shall be done by drilling, chipping, barring, wedging, or similar methods in which explosives are not used and which will leave the foundation or side walls in a solid and unshattered condition. Whenever a bench or other horizontal excavated rock surface intersects a vertical or sloped face, the excavation of the horizontal surface shall be completed before the vertical or sloped surfaces is begun. Blasting for the bench excavation shall be carefully controlled to prevent damage to that rock which will subsequently form the vertical or sloped face. Where major incipient or open planes of cleavage or jointing are encountered which approximate and are outside the design lines and grades and present a potential slip or slide condition not amenable to bolting, excavation shall be made to planes as directed by the Contracting Officer at applicable unit prices. The side of all rock

cuts will be carefully scaled of all loose and projecting rock as excavation progresses. The contract price for rock excavation shall include scaling of the side slopes. Rescaling will be required at no additional cost to the Government as often as may be necessary to permit thorough inspection of the rock surface or whenever rock remaining in the side slopes loosens to the extent that it becomes a potential safety hazard in the opinion of the Contracting Officer.

d. Blasting. - Blasting shall be governed by the safety requirements of Paragraph SC-43 of the SPECIAL CONDITIONS, and the following requirements. All damage resulting from blasting beyond the limits of the work shall be repaired or otherwise satisfactorily cared for by the contractor at his expense. Blasting within 100 feet of concrete which has been in place less than seven (7) days will not be permitted under any circumstances, and blasting in the vicinity of concrete older than seven (7) days will be permitted only if approved in advance by the Contracting Officer. The contractor or his surety shall make prior inspection or investigations of structures near the areas of blasting and shall provide such vibration monitoring as necessary during the blasting operations to assure conformance with regulatory statutes or directives established by the state or other authorities to limit vibratory effects. Such investigations shall be conducted and reported by a qualified vibration engineer, and copies in duplicate of any reports will be furnished the Contracting Officer. Reports shall include plan of drilling, amount and type of loadings, kind and distribution of blasting caps, delays used and amount of explosive per delay, order of firing, names of observers and interpreter, distance and direction of recording station from blast area, type of ground at recording station, exact time of reading, displacement and frequency, copy of records and brief comment on vibratory effects. Costs of vibration monitoring or other investigations in connection with vibration engineering shall be met by the contractor.

e. Definition of Lines. - (1) Rock excavation on which concrete structures are to be placed shall be to the following lines:

(a) The "A" line indicates the minimum thickness of concrete and is the minimum excavation line. No excavation will be required beyond this line.

(b) The "B" line is located 12 inches outside the "A" line on the side slopes and 6 inches outside the "A" line on horizontal surfaces. Payment for concrete and rock excavations will be made to the "B" line regardless of whether the actual limits fall inside or outside the "B" line. In the event that excavations for any structures should reveal that rock or other material encountered at design grades would provide unsatisfactory foundation, the excavation limits in the area shall be adjusted as necessary to provide an acceptable foundation. Necessary adjustments in foundation grade will be made by the Contracting Officer and will be furnished to the contractor in writing. Additional excavations and concrete quantities required by such adjustment will be paid for at the existing contract prices for these items.

f. Slides. - In the event of rock slides in any area of rock excavation which are determined by the Contracting Officer to be caused through no fault or negligence on the part of the contractor, the contractor will be directed in writing as soon as practicable after the slide occurs to perform such corrective measures as are deemed necessary by the Contracting Officer and will be paid for at the contract unit price per cubic yard for Rock Excavation. Any slides not covered by a written directive by the Contracting Officer shall be removed and disposed of at no additional cost to the Government.

g. Rock Foundation Preparation. - (1) Concrete Structures. - Rock surfaces upon or against which concrete is to be placed shall be prepared in accordance with Section 9, CONCRETE.

(2) Embankment Fill and Backfill. - To the extent practicable and at the direction of the Contracting Officer, overhangs and abrupt, prominent protrusions of the rock surface in areas to be hand cleaned under the compacted impervious fill and random fill sections of the dam embankment shall be carefully removed by barring, wedging, drilling and light blasting to the surrounding general level of the rock surface. Surfaces upon or against which other earth embankment fills or earth backfill is to be placed shall be cleaned as specified in Paragraph 3-05 for other rock surfaces.

h. Clean-Up for Inspection. - A clean-up condition shall be maintained at all times during grouting operations to facilitate observations for leaks and their caulking. Clean-up shall consist of removal of all loose materials and water, followed by thorough cleaning of rock surfaces by jets of air, jets of water, or a combination of both as directed. Where questionable foundation conditions exist during excavation, a preliminary clean-up may be required for purposes of inspection over an area specified by the Contracting Officer. If, after clean-up, the foundation is found to be unsatisfactory, additional excavations shall be made as directed, and this procedure of excavation and clean-up for inspection will be repeated until a satisfactory foundation is reached and at no increase in the contract unit price for such work.

3-08. MEASUREMENT. - a. Unclassified Excavation, General. - Measurement for unclassified excavation, general, as classified in Paragraph 3-03 and as defined in Paragraph 3-04, herein, to be paid for, will be by the cubic yard for the amount of material removed as unclassified excavation, general, and disposed of in accordance with these specifications. Areas from which materials are to be removed as unclassified excavation, general, will be surveyed immediately prior to commencement of the excavation. The survey will be made after clearing but prior to grubbing. All measurements will be based on this survey regardless of any changes which may occur in the areas during prosecution of the work. Measurements will be made between the grade and slope lines indicated on the drawings or staked in the field and the ground surface as indicated by the survey. Wherever the excavation or stripping extends to a bedrock surface or to grades not definitely defined by lines shown on the drawings or staked in the field, a survey will be made of the rock surface or final grade to determine the lower limits of measurement for unclassified excavation, general. The volume to be paid for shall

not include the volume of materials excavated below or outside the measured limits defined above except that which is specifically authorized to remove unsuitable foundation material. The volume of excavation to be paid for as unclassified excavation, general, shall not include the volumes of materials paid for or included under other items of work.

b. Unclassified Excavation, Borrow. - Measurement for unclassified excavation, borrow, as defined in Paragraph 3-06 of these specifications, to be paid for, will be made by the cubic yard for the amount of materials satisfactorily removed as unclassified excavation, borrow, and disposed of in accordance with the specifications and drawings. A survey of the borrow areas will be made after clearing and just prior to the beginning of stripping operations in the borrow area and all measurements for the excavation will be based on this survey without regard to any changes in the ground surface of the borrow area that may occur during the prosecution of the work. Surveys of the borrow area will be made after completion of excavation and grading but prior to the placement of stripping material on the surfaces exposed by the excavation. Where the final borrow area contains spoil material, the final survey in the spoil area will be the base surface of such material. Measurement for permanent interceptor ditches outside the limits of the excavation for borrow, shall be the volume between the ground and final surfaces as indicated by the above mentioned surveys. The volume of borrow to be paid for shall be the volume as measured above reduced by the volume of boulders excavated from the borrow area and classified and paid for as Item 5, "Rock Excavation".

c. Rock Excavation. - Measurement for rock excavation as classified in Paragraph 3-03b herein, will be by the cubic yard of material satisfactorily removed by rock excavation and disposed of in accordance with the specifications and drawings. Quantities of bedrock excavation as rock excavation, including the removal of overhanging rock during foundation preparation will be measured in place as the volume between the grades and lines indicated on the drawings, or as modified by the Contracting Officer, and the surface of the rock as indicated by the surveys specified in Paragraph 3-03 herein. The volume of rock to be paid for shall include the sum of the volumes of boulders and rock blocks classified as rock excavation. Only those blocks and boulders will be paid for which have been measured by the Contracting Officer. See Paragraph 3-07e for definition of payment lines for rock excavation in locations where concrete is to be placed against rock surfaces.

d. Machine Cleaned Bedrock Surfaces. - No separate measurement will be made for machine cleaned bedrock surfaces as defined in Paragraph 3-05 of these specifications. All costs in connection with machine cleaned bedrock surfaces shall be included as applicable under Item 3, "Unclassified Excavation - General" and Item 5, "Rock Excavation".

e. Hand Cleaned Bedrock Surfaces. - Measurement for hand cleaned bedrock surfaces as defined in Paragraph 3-05 of these specifications to be paid for will be made by the number of squares (a square

being a unit of 100 square feet). The area of measurement for payment purposes for all work except as specified herein, will be the sum of the areas on horizontal planes produced by a vertical projection of the limits of the actual areas cleaned. The measurement for payment for hand cleaning the side excavation slopes of the conduit will be the actual area of the slopes as determined by field surveys. Payment for cleaning of rock surfaces upon which concrete is to be placed is included under the applicable concrete item.

3-09. PAYMENT. - No payment will be made for excavation specified or indicated to be under other items of work.

a. Unclassified Excavation, General. - Unclassified excavation, general, as defined and covered in this section of the specifications and measured in accordance with the provisions of Paragraph 3-08 above, will be paid for at the contract unit price per cubic yard for Item 3, "Unclassified Excavation-General". Such payment shall constitute full compensation for all work in connection with excavating, hauling, stripping, grading, stockpiling, rehandling from stockpiles, drainage, dewatering and pumping not paid for under other items, grading spoil areas, placement of materials in spoil areas, the stabilization of construction slopes and all other work specified herein in connection with unclassified excavation, general. Payment of Item 3, "Unclassified Excavation-General" shall not include payment for lowering the water table and dewatering for the dam foundation cutoff, foundation drain and removal of 12-inch cast iron water main through the dam foundation, which is to be paid for as part of the contract lump sum price for Item 2, "Control and Diversion of Water". No separate payment will be made for stripping in areas where stripping is not required, in order to obtain topsoil material, all costs in connection with this work being subsidiary to the contract unit price for Item 49, "Topsoiling, Rehandle and Place".

b. Unclassified Excavation, Borrow. - Unclassified excavation, borrow, as defined and covered in this section of the specifications and measured in accordance with the provisions of Paragraph 3-08, above, will be paid for at the contract unit price per cubic yard for Item 4, "Unclassified Excavation-Borrow". Such payment shall constitute full compensation for all work in connection with clearing, stripping, excavations, hauling, disposal of spoil materials, grading, drainage, stockpiling, and rehandling of stockpiled materials, the spreading of stripping material, fertilizing, seeding and mulching in the excavated areas, and all other work specified in connection with unclassified excavation, borrow.

c. Rock Excavation. - Rock excavation as defined and covered in this section of the specifications and measured in accordance with the provisions of Paragraph 3-08, above, will be paid for at the contract unit price per cubic yard for Item 5, "Rock Excavation". Such payment shall constitute full compensation for all work in connection with drilling, blasting, excavation, hauling to project features, processing plants or

spoil areas, stockpiling of unprocessed rock excavation and re-excavation from the stockpiles, cleaning excavated surfaces, except hand cleaned rock surfaces, scaling, breaking of rock to specific sizes and all other work specified herein in connection with rock excavation which is not paid for under other items. Such payment shall not include compensation for the processing of material from rock excavation for the production of rock slope protection material in accordance with the provisions of Section 6, "ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL".

d. Hand Cleaned Rock Surfaces. - Hand cleaned bedrock surfaces as defined and covered in this section of the specifications and measured in accordance with the provisions of Paragraph 3-08, above, will be paid for at the contract unit price per square (100 square feet) for Item 7, "Hand Cleaned Bedrock Surfaces". Such payment shall constitute full compensation for scraping, cleaning, washing, sweeping, cleaning with jets, all work in excess of that usually required for unclassified excavation, general, and rock excavation, and all work required to obtain the specified results. Such payment shall also include all costs in connection with filling joints and cracks in bedrock surfaces with mortar as specified in Paragraph 5-05b, including furnishing of all cement, sand and water, mixing and placing of mortar and removal of excess mortar from surfaces, and all other incidental work required for filling the cracks and joints. Such payment shall not include compensation for the preparation of rock surfaces upon which concrete is placed.

SECTION 4
GRAVEL BASE AND SURFACE COURSES
(Item 44)
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SECTION 4

GRAVEL BASE AND SURFACE COURSES (Item 44)

4-01. SCOPE. - This section covers the gravel base course for bituminous concrete pavements and for bituminous treated surfaces and gravel surface courses for roadway, shoulders and driveways. This section does not cover road gravel which is specified in Section 6, ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL.

4-02. FORMATION OF SUBGRADE. - The area of the roadbed upon which the gravel base and surface courses, including shoulders, are to be placed shall be known as the subgrade. These areas shall be prepared for reception of the gravel base and surface courses as specified in Section A-8 of the Massachusetts Standard Specifications.

4-03. GENERAL. - Gravel base and gravel surface shall conform to Section B-1 of the Massachusetts Standard Specifications.

4-04. MEASUREMENT. - Measurement of gravel for base and surface courses and for shoulders will be made by the cubic yard of material acceptably placed to the compacted depth and to the width as shown on the plans or directed by the Contracting Officer.

4-05. PAYMENT. - Payment will be made at the contract unit price per cubic yard for Item No. 44, "Gravel for Base and Surface Courses and Shoulders", which price shall include furnishing all materials and performing all work specified in this section including formation of subgrade, furnishing and placing of all materials, tools, equipment and labor incidental thereto.

SECTION 5

EMBANKMENTS - DAM AND DIKE (Items 7, 10 thru 15, Incl., 18, and 23A)

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SECTION 5

EMBANKMENTS - DAM AND DIKE (Items 7, 10 thru 15, Incl, 18, and 23A)

5-01. SCOPE. - The work covered by this section consists of furnishing all plant, labor, equipment, and appliances, and of performing all operations in connection with the preparation of foundations for embankments and backfills and the placement and compaction of all materials, in the embankments and backfills, except as hereinafter provided, and in strict accordance with the contract drawings and specifications and subject to the terms and conditions of the contract. The provisions in this section of the specifications are applicable for portions of the dam and dike embankments constructed of rock slope protection, topsoil, road gravel, gravel bedding, bubble gage shelter fill, gravel base and pavement except as otherwise specified in Section 6, ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL, Section 13, BUBBLE GAGE SHELTER, and in other sections of these specifications. This section does not cover the embankments, fills and backfills for the highway relocation, access road, turnarounds, culverts, drains and appurtenant structures which are covered in Section 5A, HIGHWAY FILL, and Section 11, EXCAVATION, TRENCHING AND BACKFILLING FOR CULVERTS AND DRAINS.

5-02. DEFINITIONS. - a. Embankment. - The term "embankment" as used in this section of the specifications is defined as including all portions of the dam and dike, (including Sutcliffe Road) exclusive of backfills and concrete structures, between the top of dam or dike, the outer slope lines, and the foundation surfaces after stripping and required excavations. The foundation cut-off, the foundation drain and the refilling of the excavation for the removal of the existing 12-inch cast iron water main through the dam foundation area are considered as part of the dam embankment under this definition.

b. Backfill. - The term "backfill" as used herein is defined as fill material placed adjacent to or over concrete structures and elsewhere in areas (1) where heavy or large equipment is not permitted to operate in order to avoid damage to these structures, and (2) where heavy or large equipment cannot operate due to space limitations. The types of backfill include "compacted impervious backfill" and "compacted gravel backfill".

c. Compacted Backfill. - The term "compacted backfill" as used herein is defined as backfill material deposited in thin layers and compacted with power tampers or surface vibrators as specified. All backfill material shall be compacted unless otherwise directed or designated on the drawings.

d. Special Impervious Fill. - The term "special impervious fill" is defined as impervious fill adjacent to certain steep surfaces of walls and bedrock and in depressions in bedrock surfaces which is composed of impervious fill material placed in thin layers by hand and compacted with power tampers in order to insure a very tight contact between the fill and the structure or bedrock surface and to insure satisfactory compaction of the fill material in the vicinity of the surface. Special impervious fill is the same as compacted impervious backfill except that (1) the operation of heavy compaction equipment shall extend into the zone of special impervious fill during the compaction of the adjoining fill material and (2) that heavy construction equipment may operate within that zone.

5-03. GENERAL PROVISIONS. - a. Lines and Grades. - (1) General. - The embankment sections and backfill sections shall be constructed to the lines, grades and cross sections indicated on the drawings or as defined herein unless otherwise directed by the Contracting Officer. All fills and backfills shall extend to the bottom and the slopes of an excavation regardless of the location of the payment or excavation lines shown on the drawings. The Government reserves the right to increase or decrease the foundation widths or the slopes of any embankments, or to make such other changes in the fill and backfill sections as may be deemed necessary to produce safe and satisfactory structures or to utilize materials available from required excavations to the maximum extent possible. Increases in the height of embankment to compensate for shrinkage or consolidation of the embankment materials subsequent to completion of the embankment will not exceed five (5) percent of the height above the foundation indicated on the drawings. Changes in quantity of materials resulting from prescribed changes in section shall not be made cause for claims for increased unit prices.

(2) Gravel Fill on Bedrock. - It is anticipated that in certain areas the bedrock surface upon which compacted gravel fill is to be constructed may be too uneven for the practicable construction of a layer of the thickness indicated on the drawings. During the progress of the work, the Contracting Officer will establish the grades and elevations of the surface of the compacted gravel fill in such areas so as to provide a layer thickness as near as practicable to that indicated. These limits will be established so that at least 12 inches of gravel fill will be constructed over the high points of the rock surface.

b. Conduct of Work. - The contractor shall maintain and protect all excavations, Foundation areas, backfills, and uncompleted portions of the embankment in a satisfactory condition and at all times until final completion and acceptance of all work under the contract. Any approved fill or backfill material which is lost in transit or rendered unsuitable after being placed in a fill or backfill section and before final acceptance

of the work shall be replaced by the contractor in a satisfactory manner and no additional payment will be made therefor. The contractor shall excavate and remove from sections of fill and backfill any material which the Contracting Officer considers objectionable and shall also dispose of such material and refill the excavated area as directed, all at no cost to the Government. The contractor may be required to remove, at his own expense; any material placed outside of the prescribed slope lines.

c. Haul Roads. - Haul roads shall be located and constructed as approved by the Contracting Officer. They shall be designed to maintain the intended traffic, to be free draining and shall be maintained in good condition throughout the contract period, unless otherwise directed by the Contracting Officer. The contractor may not use materials from required and borrow excavations for the construction of haul roads and construction areas except those materials specifically designated to be placed in spoil areas. No separate payment will be made for the construction of haul roads and other work incidental thereto, the cost of which will be considered as a subsidiary obligation of the contractor.

5-04. MATERIALS. - a. General. - (1) Materials from required excavations and borrow excavations. - Materials for random and impervious fills and impervious backfills shall be obtained from the required excavations for the dam and dike and from the borrow area indicated on the drawings. The intention is to utilize suitable material from the required excavations to the extent possible so as to minimize the need for required borrow. Except as stated in Section 3, EXCAVATION, material to be spoiled will be specifically designated by the Contracting Officer at the time the material is excavated. Materials containing brush, roots, sod, humus or other perishable materials will not be considered suitable. Materials otherwise suitable except for roots shall be used for fill or backfill after the roots are removed. The suitability of the fill materials shall be subject to the approval of the Contracting Officer and their disposition in fill and backfill sections will be as directed by the Contracting Officer. The contractor shall excavate in the borrow area in the locations determined by the Contracting Officer whenever such control is necessary to obtain the type of material required for the embankments. If directed by the Contracting Officer, the contractor shall excavate pits within the limits of the borrow area and areas adjacent thereto for the purpose of exposing material, at no additional cost to the Government. Mixing of materials during the excavating process in the borrow area and the required excavations may be required to the extent possible with the type of equipment being used. No source of material will be rejected as the result of the material in place containing oversize stones. Oversize stones in fill and backfill materials, as defined in other paragraphs in this section, shall be removed from the materials prior to compaction or during placement where compaction is not required.

(2) Materials furnished by contractor. - The following standards of the American Society for Testing and Materials form a part of this specification for materials to be furnished by the contractor:

| | |
|----------|--|
| D75-59 | Sampling Stone, Slag, Gravel, Sand and Stone Block for Use as Highway Materials. |
| C136-63 | Test for Sieve or Screen Analysis of Fine and Coarse Aggregate. |
| D421-58 | Dry Preparation of Soil Samples for Grain Size Analysis and Determination of Soil Constants. |
| D422-62T | Grain Size Analysis of Soils. |

Materials for use as sand fill, gravel fill, gravel backfill, and processed sand fill shall consist of approved materials furnished by and at the expense of the contractor. These materials shall consist of tough durable particles and shall be reasonably free from thin, flat and elongated pieces and shall contain no organic matter, sod, roots, brush, debris or soft friable particles in quantities considered objectionable by the Contracting Officer. The sources from which the contractor proposes to obtain any of the materials covered in this subparagraph shall be selected well in advance of the time when the material will be required in the work. Unless otherwise directed, suitable samples of the material for testing from any source selected by the contractor shall be submitted to the Contracting Officer for approval prior to the delivery of the material to the site of work from the source. Unless otherwise specified, all test samples for material shall be obtained by the contractor and delivered at his expense to a point designated by the Contracting Officer at least 30 days in advance of the time when the placing of the material is expected to begin. Sampling of the materials shall be done by the contractor in accordance with ASTM D75-59 at his own expense and in the presence of a representative of the Contracting Officer. The samples shall be subjected to such tests as are necessary to determine the acceptability of the material for use in the work unless suitable test reports and/or service records are available that are satisfactory to the Contracting Officer. The Contracting Officer shall be the sole judge as to the acceptability of the materials. All tests will be made by, or under the supervision of the Government and at its expense. The approval of a material by the Government, based on test results, examination of the materials exposed at the source, and service records shall not relieve the contractor, in any way, of the responsibility of placing a material which meets the requirements specified herein. Approval of a material from a source shall not be construed as approval of all materials from that source. The right is reserved to reject, at any time, any or all portions of the materials in the source when such materials are unsuitable in the opinion of the Contracting Officer. During or after placement of contractor furnished materials, test samples will be taken and tested to determine gradations of the materials in accordance with ASTM C136-63, D521-58 and D422-62T. Such sampling and testing will be done by the Government. All or any portions of contractor

furnished material placed which are not of approved quality or which do not have the specified gradation shall be removed at no additional cost to the Government. The loading and hauling of any contractor furnished material shall be performed in a manner that will prevent segregation and will assure placement of well graded material.

b. Impervious Fill. - Impervious fill material to be used in the construction of the dam embankment shall consist of approved material obtained from those portions of the borrow area as specified in Section 3, EXCAVATION. Impervious fill material shall consist of relatively well graded soil in which at least 30 percent, by dry weight of the particles passing the No. 4 U.S. Standard Sieve shall pass the No. 200 U.S. Standard Sieve.

c. Random Fill. - Random fill material for use in the dike embankment shall consist of approved materials obtained from the required excavations for the dam and dike. Random fill material for use in the construction of the dam embankment shall consist of approved materials obtained from the required excavations for the dam and from those portions of the borrow area as specified in Section 3, EXCAVATION. Impervious fill material may be used in the upper portion of the random fill zone of the dam embankment if a sufficient quantity of random fill material is not available in the borrow area.

d. Sand Fill. - Sand fill material for use in the construction of the dam and dike embankments shall be approved material consisting of reasonably well graded bank-run sand or gravelly sand furnished by the contractor from which all oversize stones, as defined by Subparagraph 5-06f(1) have been removed either at the source or during spreading. Sand fill material shall conform to the following gradation requirements.

(1) Of the component of the material passing the 3-inch U.S. Standard Sieve, not less than 50 percent by dry weight, shall pass the No. 4 U.S. Standard Sieve.

(2) Of the component passing the No. 4 U.S. Standard Sieve, between 15 and 100 percent by dry weight of the particles shall pass the No. 40 U.S. Standard Sieve, and not more than 10 percent by dry weight of the particles shall pass the No. 200 U.S. Standard Sieve and not more than 3 percent by dry weight of the particles shall have a diameter of less than 0.01 millimeters.

e. Gravel Fill. - Gravel fill material shall be approved material consisting of reasonably well-graded bank-run sandy gravel or gravelly sand furnished by the contractor from which all oversize stones, as defined in Subparagraph 5-06f(1), have been removed either at the source or during spreading. Gravel fill material shall conform to the following gradation requirements:

(1) Gravel fill material shall not contain more than 50 percent, by dry weight, of stones larger than 3 inches in maximum dimension.

(2) Of the component of the material passing the 3-inch U.S. Standard Sieve, at least 25 percent and no more than 60 percent, by dry weight, of the particles shall pass the No. 4 U.S. Standard Sieve.

(3) Of the component of the material passing the No. 4 U.S. Standard Sieve not more than 10 percent, by dry weight, of the particles shall pass the No. 200 U.S. Standard Sieve and not more than 3 percent, by dry weight, of the particles shall have a diameter of less than 0.01 millimeters.

f. Processed Sand Fill. - Processed sand fill material shall consist of approved material furnished by the contractor meeting the gradation specification for fine concrete aggregate as provided in Section 9, CONCRETE.

g. Backfill. - Materials for impervious and gravel backfills shall be obtained from the same sources and shall meet all requirements for materials as specified for the corresponding fill materials except that the maximum stone sizes will be as specified in Subparagraph 5-06f(1) of this section.

5-05. PREPARATION OF FOUNDATION. - a. Earth Foundations for Embankments. - This paragraph covers the preparation of the foundation areas for the dam and dike embankments to be constructed on earth foundations. After stripping to approved depths of each area of the embankment foundations as required, the sides of stump holes, previous excavations, and other similar cavities or depressions within the stripped area shall be broken down so as to flatten out the slopes and the sides of the cuts or holes except in the areas of the excavations for the foundation cutoff, foundation drain and for removal of the existing 12-inch cast iron water main through the dam foundation. Each depression in the foundation area of the compacted impervious fill section and the compacted random fill section shall be filled with impervious fill material and random fill material, respectively. The impervious and random fill material shall be placed in layers, moistened, and compacted in accordance with the applicable provisions of Paragraphs 5-06, 5-07, and 5-08 of this section. After filling of depressions and immediately prior to placement of embankment material in areas outside the limits of the foundation cut-off, foundation drain and excavation for the water main through the dam foundation, the foundation soil shall be loosened thoroughly by scarifying, plowing, or harrowing to a depth of 8 inches, except where the slope of the foundation surface is steeper than 1 vertical on 4 horizontal and except in areas where this requirement is waived by the Contracting Officer. After the

removal of roots and other debris turned up by the loosening process, the loosened surface of the embankment foundation area shall be completely dewatered and shall be compacted by 10 complete passes of the compaction equipment as hereinafter specified for the compaction of impervious and random fill material. Where the slope of the foundation surface is steeper than 1 vertical on 4 horizontal in areas outside the limits of the foundation cut-off, drain and excavation for water main, the foundation surface shall be compacted by the overlapping of the rolling of the contiguous horizontal layers of fill material onto it in such a manner as to produce a number of coverages of the foundation surface equal to at least twice that required for the adjacent fill material. No separate payment will be made for loosening, scarifying, dewatering, and rolling the foundation areas, but the entire cost thereof shall be included in the contract unit price for the adjacent embankment materials.

b. Bedrock Foundations for Embankments. - Bedrock surfaces upon or against which embankment materials are to be placed shall be cleaned in accordance with the provisions of Section 3, EXCAVATION. Prior to the placement of random and impervious material on or against bedrock, all open joints and cracks within the area of contact of hand cleaned surfaces shall be filled to the depths cleaned, with mortar. In areas of contact of hand-cleaned surfaces with impervious or random fill material where, in the opinion of the Contracting Officer, compaction cannot be accomplished by power tampers or other compaction equipment, such areas shall be filled with mortar or concrete, as directed, to the extent necessary to permit satisfactory use of the specified compaction equipment. In areas of contact of hand-cleaned surfaces with impervious or random fill materials where it is not practicable to remove overhangs of the rock surface as specified in Subparagraph 3-07g(2), such areas shall be filled with concrete or mortar as directed. Concrete or mortar shall be used when necessary to provide for complete filling of the space beneath the overhang and to provide a non-overhanging surface flatter than 4 vertical on 1 horizontal, all as directed, against which impervious and random fill materials can be placed and compacted with the specified equipment. Mortar to be used as specified above, shall be composed of one (1) part of portland cement and two (2) parts sand. Concrete including forming to be used when specified above shall conform to the requirements of Section 9, CONCRETE. Sand for the mortar shall conform to Federal Specification SS-A-281b and shall have a gradation within the following limits:

| <u>U.S. Standard Sieve</u> | <u>Percent Passing by Dry Weight</u> |
|----------------------------|--------------------------------------|
| No. 8 | 100 |
| No. 16 | 95-100 |
| No. 30 | 60-85 |
| No. 50 | 20-50 |
| No. 100 | 10-30 |
| No. 200 | 0-5 |

Sand for mortar to fill cracks and joints greater than 1/2 inch in width may be as specified for fine concrete aggregate in Section 9, CONCRETE. The consistency of the mortar and the methods and devices used for the placement of mortar shall be such as to insure complete filling to the satisfaction of the Contracting Officer. In no case shall a thin coat of mortar be left to cover any portion of the bedrock surface. The foundation areas of the embankments shall be completely dewatered during placement of fill materials.

c. Backfill. - Prior to the placement of backfill material all mud, stones, lumber and other debris shall be removed from the foundation area to the satisfaction of the Contracting Officer and the foundation area shall be completely dewatered. Bedrock surfaces against which backfill materials are to be placed shall be prepared as specified in Subparagraph b, above for corresponding fill materials.

5-06. PLACEMENT OF FILL MATERIALS. - a. General. - The placement of rock slope protection, gravel bedding, and road gravel materials shall be in accordance with Section 6, ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL and is not covered by this paragraph. No fill material shall be placed on any part of any embankment foundation area until the area has been inspected and approved by the Contracting Officer. No fill shall be placed against concrete structures until the concrete has been in place at least 14 days. No fill or backfill material shall be placed in any area inundated with water. The gradation and distribution of material throughout any fill section of the embankment shall be such that the section will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding material in the same section. Successive loads of material shall be dumped at locations on the fill as directed or approved by the Contracting Officer. No fill material shall be placed upon a surface of frozen material, nor shall snow, ice, or frozen material be incorporated into any fill section. No fill material shall be placed on previously placed fill material which, in the opinion of the Contracting Officer has been affected by frost until the surface of the previously placed material has been loosened and recompactd as specified in Paragraph 5-05, above, for earth foundation preparation. No fill material shall be placed in an area within which compaction equipment is being operated. Layers of fill materials which are to be compacted shall be placed and spread over areas large enough to permit an orderly pattern for operating compaction equipment.

b. Rate and Sequence of Placement. - The dam and dike embankments shall be constructed in such a manner that the area of placement of materials will be approximately horizontal and shall extend for the full width and full length of the embankment at the elevation of the working surface regardless of the number of different fill materials required except as noted below. When portions of fill sections or complete fill

sections are constructed ahead of adjacent fills as permitted or required in accordance with the requirements below, the area of placement of materials will be approximately horizontal and will extend for the full width of the portion being constructed and for the full length of the embankment at the elevation of the working area.

(1) The zones of compacted gravel fill, compacted sand fill and compacted processed sand fill that comprise the horizontal drainage blankets of the dam and dike and dam foundation drain may be constructed ahead of the adjoining fills.

(2) All or a portion of the height of the initial compacted random fill section of the dam embankment below Elevation 730 may be constructed prior to the adjoining compacted impervious fill section, but after placement of compacted impervious fill in the foundation cutoff below approximately El. 695, in order that all approved available random fill material obtained from the required excavations for the dam, (including portions of the foundation cutoff and foundation drain) and portions of the spillway channel shall be utilized in the embankment construction.

(3) The fill material for the inclined compacted sand fill section of the dam shall be placed at least 1 foot and no more than 3 feet vertically in advance of the adjacent fill sections. To accomplish this, portions of the sand fill material may overlap as necessary into the adjoining fill area for a distance no greater than 5 feet.

c. Impervious Fill. - Impervious fill material shall be placed in the compacted impervious fill sections of the dam embankment including the foundation cutoff and the excavation for the water main through the dam foundation area upstream of the inclined sand fill section. In general, the more impervious material shall be placed toward the upstream side and the less impervious material toward the downstream side of the impervious fill sections.

d. Random Fill. - Random fill material shall be placed in the compacted random fill sections of dam and dike embankments. In general, the more impervious material shall be placed toward the reservoir side and the less impervious toward the downstream or landside of the random fill sections.

e. Gravel Fill, Sand Fill and Processed Sand Fill. - Gravel fill, sand fill, and processed sand fill materials shall be placed in the compacted gravel fill, sand fill and compacted processed sand fill sections, respectively, of the embankments indicated on the drawings. Care shall be exercised to prevent contamination of these materials during and after placement by material from adjacent fill sections.

f. Spreading. - (1) General. - This paragraph covers the requirements of spreading, placing and preparation of layers for compaction for fill materials, in general. Requirements for fill material to be placed in restricted areas and for special impervious fill materials are stated in the Subparagraphs (2) and (3), below. After dumping, the material for a fill section shall be spread by bulldozers or other approved means in approximately horizontal layers over the entire fill area, except that the layers of gravel fill, sand fill and processed sand fill material, may be placed and compacted on the abutment slopes prior to the construction of the adjoining fill where practicable. The thickness of each layer before compaction with a tamping type roller, rubber-tired roller, or tractor only shall not be more than 8, 12 and 6 inches, respectively. No fill material shall be dumped or spread with mechanical equipment within areas of "special impervious fill", or "back-fill". As soon as practicable after commencement of construction of the embankment, the central portion thereof shall be raised or crowned with grades not to exceed 10 percent so that the surface of the fill will drain freely and shall be so maintained throughout construction. If the compacted surface of any layer of compacted fill is determined to be too smooth to bond properly with the succeeding layers, it shall be loosened by harrowing, or by any other approved method before the succeeding layer is placed hereon. During the dumping and spreading processes, the contractor shall maintain, at all times, a force of men and equipment adequate to remove all roots and debris from all fill materials and all stones with a maximum dimension greater than $\frac{2}{3}$ of the thickness of the loose random or impervious fill layer from which the stones are being removed and all stones with a maximum dimension greater than the thickness of the loose layer of other fills from which the stones are being removed. Stones so removed shall be picked up on the fill area and shall be placed directly in the rock slope protection sections of the structures. Rock rakes or bulldozers shall not push the stone into place. At no time shall piles of oversize rocks be temporarily left within the limits of the foundation area and lines of the embankment. Roots and debris shall be removed from the embankment and disposed of in an approved manner. The entire surface of any section of an embankment under construction shall be maintained in such condition that construction equipment can travel on any part of any one section. Ruts in the surface of any layer shall be filled satisfactorily before compacting. Random, sand, gravel, and impervious fill materials are to be placed adjacent to walls and bedrock surfaces except where backfills or special impervious fill are shown on the drawings or as directed by the Contracting Officer. During the placement or spreading of fill material adjacent to walls or bedrock surfaces, special care shall be taken to place only friable fill material, free of clods, and nested stones within 18 inches of the wall and bedrock surface. At no time shall the surface of a layer of fill adjacent to special impervious fill be above the surface of the special impervious fill.

(2) Restricted Areas. - In areas such as ditches, depressions, excavated areas with limited widths which, in the opinion of the Contracting Officer, are too restricted for the operation of the required roller to compact the random, sand, processed sand, gravel or impervious fill materials, the fill material shall be placed as specified in Subparagraph (1) above, except that the thickness of layers shall not be greater than 4 inches and except as otherwise provided herein. These areas do not include areas defined in the following subparagraph.

(3) Special Impervious Fill. - The placing and spreading of special impervious fill material adjacent to certain walls and steep rock faces and the placing and spreading of initial layers of impervious fill material against certain areas of bedrock foundations shall be as specified in Paragraphs 5-09 and 5-10 of this section, respectively.

5-07. MOISTURE CONTROL OF COMPACTED FILL MATERIALS. - The materials in each layer of fill material to be compacted shall contain the amount of moisture, within the limits specified below or as directed by the Contracting Officer, necessary to obtain the desired compaction as determined by the Contracting Officer.

a. Compacted Impervious and Random Fills. - The moisture content shall be as uniform as practicable throughout any one layer of impervious or random fill material immediately prior to and during compaction. The upper and lower limits of moisture content shall be within 2 percentage points of the optimum moisture content as determined by the Contracting Officer. It is anticipated that some of the random and impervious fill materials will have natural moisture contents greater than the specified upper limit for placement. Drying back of impervious and random fill materials will be required by such methods as spreading the material on the fill area to dry, aerating the material by discing and harrowing either at the source or on the fill, excavating drainage trenches at the source, in accordance with Section 3, EXCAVATION or other methods that will reduce the moisture content to an amount within the specified limits. Prior to the placement of any fill material, the contractor shall place on the project at least one heavy-duty 24-inch road disc harrow similar to Model D36-1-F offset disc, manufactured by the Towner Manufacturing Company, Santa Ana, California. When the materials are too dry, the contractor will be required to moisten each layer of the fill. Disc harrowing, or other approved methods, will be required to work the moisture into the material until a uniform distribution of moisture is obtained. Water applied on a layer of fill shall be accurately controlled in amount so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the embankment, so that the material is too wet to obtain the desired compaction, the rolling and all work on that section of the embankment shall be delayed until the moisture content of the material is reduced to an amount within the specified limits. If, in the opinion of the Contracting

Officer, the top or contact surface of a partial fill section has become too dry to permit suitable bond between this surface and the additional fill material to be placed thereon, the contractor shall loosen the dried materials by scarifying or discing to such depths as may be directed by the Contracting Officer, shall dampen the loosened material to an acceptable moisture content, and shall compact this layer in accordance with the applicable requirements of Paragraph 5-08, below.

b. Compacted Sand, Gravel and Processed Sand Fills. - The moisture contents of materials for sand fill, gravel fill, and processed sand fill being compacted shall be such as to prevent excessive rutting and dust and to permit satisfactory operation of the hauling and compacting equipment.

5-08. COMPACTION OF FILL MATERIALS. - a. Equipment. - Compaction equipment shall conform to the following requirements and shall be used as prescribed in subsequent paragraphs.

(1) Tamping Rollers. - Tamping rollers shall consist of a heavy duty double drum unit with a drum diameter not less than 60 inches and an individual drum length of not less than 60 inches. The drums shall be water or sand and water ballasted. Each drum shall have staggered feet uniformly spaced over the cylindrical surface such as to provide approximately three tamping feet for each two square feet of drum surface. The tamping feet shall be 7 to 9 inches in clear projection from the cylindrical surface of the roller and shall have a face area of not less than 5 nor more than 7 square inches. The roller shall be equipped with cleaning fingers so designed and attached as to prevent the accumulation of material between the tamping feet, and these cleaning fingers shall be maintained at their full length throughout the periods of use of the roller. The weight of the roller shall be not less than 2500 pounds per foot of linear drum length weighted, and shall not be more than 1500 pounds per foot of drum length empty. The design and operation of the tamping roller shall be subject to the approval of the Contracting Officer who shall have the right at any time during the prosecution of the work to direct such repairs to the tamping feet, minor alterations in the roller, and variations in the weight as may be found necessary to secure optimum compaction of the earth fill materials. At the start of compaction operations, the drums of the rollers shall be full of water. Placement of the embankment materials shall not commence unless every tamping foot of every roller to be used has a plane surface area as specified by the manufacturer of each roller. If, during the placement of fill the plane surface area of any tamping foot on a roller becomes equal to or less than two-thirds of the manufacturer's specified area, the use of the roller shall not be permitted until the plane areas of all tamping feet on the roller are restored to the manufacturer's specified area. The roller shall be pulled by a tractor of sufficient power to operate the roller at a speed of approximately 3 miles per hour.

(2) Rubber tired Rollers. - Rubber-tired rollers shall have a minimum of four wheels equipped with pneumatic tires. The tires shall be of such size and ply as can be maintained at tire pressures between 80 and 100 pounds per square inch for a 25,000 wheel load during rolling operations. The roller wheels shall be located abreast and be so designed that each wheel will carry approximately equal load in traversing uneven ground. The spacing of the wheels will be such that the distance between the nearest edges of adjacent tire will not be greater than 50 percent of the tire width of single tire at the operating pressure for a 25,000 pound wheel load. The roller shall be provided with a body suitable for ballast loading such that the load per wheel may be varied, as directed by the Contracting Officer, from 18,000 to 25,000 pounds. The roller shall be towed at speeds not to exceed ten miles per hour. The character and efficiency of this equipment shall be subject to the approval of the Contracting Officer.

(3) Crawler-Type Tractor. - A crawler-type tractor to be used in the compaction of gravel fill, sand fill, and processed sand fill layers as well as the compaction of random and impervious fill layers in restricted areas where it is impracticable to operate a roller, shall weigh not less than 20,000 pounds and shall exert a unit tread pressure of not less than 9 pounds per square inch.

(4) Power tampers. - Power tampers for the compaction of compacted backfill and special impervious fill shall be commercially manufactured pneumatic tampers approved by the Contracting Officer. Jackhammers and similar equipment not specifically designed and manufactured for the compaction of earth will not be approved.

(5) Surface Vibrator. - A surface vibrator for use in compacting gravel backfills shall be a commercial make of plate surface vibrator similar or equal to the Jackson Vibratory Compactor manufactured by the Electric Tamper and Equipment Company, Ludington, Michigan and approved by the Contracting Officer.

b. Compacted Impervious and Random Fills. - After a layer of impervious or random fill material has been dumped and spread, it shall be disc harrowed, if required, to break up and blend the fill materials, unless disc harrowing as specified under Paragraph 5-07 of this section is performed to obtain uniform moisture distribution. Disc harrowing shall be performed to a depth of at least 6 inches. When the moisture content and the condition of a layer is satisfactory, the lift shall be compacted by not less than 6 complete passes of the tamping roller or 4 complete passes of the rubber-tired roller, except as otherwise stated herein. A complete pass shall consist of the entire coverage of the area with one trip of the equipment specified. Each trip of the tamping roller shall overlap the adjacent trip not less than two feet. In no

case shall rollers be operated within zones of compacted backfill. A roller shall be operated to overlap the layers within zones of "special impervious fill" as specified in Paragraph 5-10. In areas such as ditches, depressions, excavated areas with limited widths or extents, which, in the opinion of the Contracting Officer, are too restricted for operations of a required roller to compact the fill material, the fill materials shall be placed as specified in Subparagraph 5-06g(2) and each layer shall be compacted by 6 coverages of the tread of the specified crawler-type tractor after the material in the layer is satisfactorily conditioned for moisture content. At the outer slopes of the embankment, special care shall be taken to insure the required compaction of all random and impervious materials prior to placement of gravel bedding materials. Dumping, spreading, moisture conditioning and compacting of a layer of fill material may be performed simultaneously, providing there is a sufficient total area to permit these operations to proceed in different areas of fill. The compaction operations shall be confined, until completed, to one area adequate in size for establishing an orderly pattern of rolling. No dumping, spreading or moisture conditioning shall be performed within the area being rolled during the period of the compacting operation.

c. Special Impervious Fills. - Special impervious fill material adjacent to certain walls and bedrock surfaces shall be compacted as specified in Paragraph 5-10 of this section.

d. Compacted Sand, Gravel and Processed Sand Fill. - After each layer of gravel fill material, sand fill material or processed sand fill material has been dumped and spread and its moisture content and condition determined to be satisfactory, it shall be compacted with 6 coverages of the tread of the specified crawler-type tractor.

e. Additional Rolling. - If, in the opinion of the Contracting Officer, the desired compaction of the material for any portion of compacted embankment fill is not secured by the minimum number of passes or coverages specified, additional complete passes or coverages shall be made over the surface area of such designated portion until the desired compaction has been obtained.

5-09. INITIAL FILL ON BEDROCK. - The areas of bedrock surfaces upon which or adjacent to which compacted gravel, impervious or random fill materials are to be placed shall be stripped and cleaned as specified in Section 3, EXCAVATION. The initial layer of gravel fill materials placed upon bedrock surfaces shall be as specified in Paragraphs 5-06, 5-07 and 5-08 of these specifications. During the placement of layers of random or impervious fill material, special effort shall be made to obtain compaction adjacent to and a tight contact with inclined bedrock surfaces using the rolling equipment, treads of tractors, or wheels of rubber-tired

equipment available at the site of the work. The open joints and cracks in the areas of bedrock surface upon or adjacent to which compacted impervious fill material is to be placed shall be filled with mortar as and where specified in Paragraph 5-05, above. Prior to the placement of a layer of impervious or random fill material which is to be compacted by the specified rollers or by the specified crawler-type tractor upon a bedrock surface, depressions, steps, or cavities in the bedrock surface, as selected by the Contracting Officer, within the contact area, shall be filled with mortar or concrete in accordance with Paragraph 5-05, above, or with special impervious fill in accordance with Paragraph 5-10 below. The initial layers of impervious and random fill material to be compacted by rolling placed upon bedrock surfaces shall be as specified in Paragraphs 5-06, 5-07 and 5-08 of these specifications.

5-10. SPECIAL IMPERVIOUS FILL. - a. Walls and Steep Bedrock Surfaces. - Special impervious fill material shall be placed adjacent to all walls within the contact areas of the surfaces of the walls and the compacted impervious fill sections and to steep bedrock surfaces at the sections shown on the drawings and at other locations as directed by the Contracting Officer. The special impervious fill material shall be placed and compacted in a manner to insure a very tight contact between the fill and the wall or bedrock surface and satisfactory compaction of the fill in the vicinity of the surface. The special impervious fill material shall be the same material and shall be placed, conditioned and compacted as specified for impervious backfill in Paragraph 5-11 of this section. The special impervious fill shall extend away from the wall or bedrock surface at least 12 inches into the area of operation of rolling equipment. The horizontal width of special fill will vary according to the unevenness and steepness of the wall or rock surface. The horizontal width of 2 feet shown on the drawings is for payment purposes only and does not indicate the actual widths that will be required. The special impervious fill material shall be placed and compacted to a height equal to the thickness of each of the adjoining fill layers prior to the placement of the adjoining fill layer. After placement of the adjoining fill layer, special impervious fill material shall not be placed until after compaction by rolling is completed along the wall or bedrock surface. During the rolling operation, the roller shall be operated as close to the wall or bedrock surface as possible, traveling parallel with the surface.

b. Depressions in Bedrock Surfaces. - Depressions, steps and cavities in the bedrock surfaces, as selected by the Contracting Officer, within the bottom of the foundation cut-off shall be filled with special impervious fill material as directed. Similar foundation areas of the compacted impervious material between the foundation cut-off of the dam and the upstream limit of the compacted sand fill zone which have been hand-cleaned in accordance with Section 3, EXCAVATION, shall be filled with special impervious fill material to the extent considered necessary by the Contracting Officer to obtain satisfactory compaction in the initial compacted

impervious or random fill layers. The use of special impervious fill material shall be limited to the amount necessary to obtain a working surface and areas which will permit the placement and compaction of initial layers of compacted impervious or random fill material as specified in Paragraph 5-09, above. The special impervious fill material shall be the same material and shall be placed, conditioned and compacted as specified for impervious backfill in Paragraph 5-11, below. At steps in the bedrock surface, the special impervious fill will generally be placed and compacted to form a uniform slope of 4 horizontal on 1 vertical.

5-11. BACKFILLS. - a. General. - The various types of backfill materials shall be placed to the lines, grades, and cross-sections indicated on the drawings or as modified by the Contracting Officer within any other zones defined by the Contracting Officer, except as stated below. All backfill materials shall be compacted as stated herein. In excavated areas adjacent to concrete structures where the actual excavation slopes do not correspond with the payment limits shown on the drawings or as modified by the Contracting Officer, the backfill shall extend to the actual excavation slopes. Only equipment specified in this paragraph shall be used to place, spread, and compact backfill. No backfill material or other load shall be placed on or against surfaces of concrete structures for periods of 14 days after placing the concrete. The materials for impervious and gravel backfills shall be as specified in Paragraph 5-04 of this section for impervious and gravel fill materials respectively. The preparation of foundation for backfill shall be as specified in Paragraph 5-05.

b. Compacted Impervious Backfill. - The placement and compaction of impervious backfill material shall be in a manner that will produce satisfactory compaction and a tight contact of the backfill material with the adjoining concrete or bedrock surface. No impervious backfill material shall be placed in water or on a surface of previously placed backfill which has become soft due to rain, frost or other conditions. All soft material shall either be recompacted or removed as directed. The material for compacted impervious backfill shall be conditioned to provide a moisture content at time of compaction between optimum moisture content and 3 percentage points above optimum as determined by AASHTO Standard Compaction Method No. T99-57, Method A. All stones greater than 3 inches in diameter shall be removed from the material during placement. Materials to be spread shall be piled outside the limits of the backfill area. The backfill shall be constructed by spreading material in layers 2 inches or less in thickness by hand shoveling. Each layer of material shall be compacted by at least 4 coverages of the tamping foot of an approved power tamper. At least two tampers shall be in operation for every laborer spreading the material. To insure the development of a tight contact of backfill material with concrete or rock surfaces, layers of material shall be placed to form a fillet adjacent to the surfaces. Each layer of the fillet shall be compacted with approved power tampers with the direction of tamping as near to perpendicular as practical to the concrete or rock surface.

c. Compacted Gravel Backfill. - The placement and compaction of gravel backfill material shall be in a manner that will produce satisfactory compaction and complete filling immediately adjacent to bedrock and concrete surfaces. Compacted gravel backfill material shall be spread by hand shoveling in approximately horizontal layers not exceeding 4 inches in thickness and each layer shall be compacted either by 4 coverages of the tamping foot of an approved power tamper or by an approved surface vibrator of standard commercial make. If a vibrator is used, the base of the vibrator shall be in contact with each square foot of the surface of the layer being compacted for a period of at least 20 seconds. All stones having maximum dimensions greater than 4 inches shall be removed from the layer prior to compaction by either method.

5-12. SLIDES. - In the event of slides in any part of the embankment prior to final acceptance of the work, the contractor shall remove material from the slide area, as directed, and shall rebuild such portion of the embankment. In case it is determined that the slide was caused through the fault of the contractor, the removal and disposal of material and the rebuilding of the embankment shall be performed without cost to the Government; otherwise this work will be paid for at the applicable contract unit prices for borrow excavation and compacted fill or backfill.

5-13. MEASUREMENT. - a. Compacted Fills. - The quantities of compacted impervious, random, sand, gravel, and processed sand fills to be paid for will be the volumes computed from the applicable lines, grades, thicknesses, and limits shown on the drawings, specified herein, or as directed for the respective embankment sections. The limits of sections of the fills or materials which are not definite on the drawings or as stated in these specifications and which depend upon topography and field conditions shall be determined by field surveys. In areas where it is impracticable to place a layer of gravel fill of uniform thickness due to the unevenness of the foundation, the limits of the gravel fill layer shall be as determined by field surveys. In the embankment where the bubble gage shelter is to be constructed, the lines, grades, and limits of the sections of fill materials will be taken as being the continuations of the normal lines, grades, and limits on either side of the bubble gage shelter.

b. Backfill. - Compacted backfills at locations shown on the drawings will be measured for payment as the volumes computed from the applicable limits and payment lines indicated on the cross sections, shown on the drawings, as stated in these specifications or as otherwise established by the Contracting Officer. The measurements shall not include the volumes of compacted backfill material placed outside the excavation payment lines shown on the drawings. Backfill directed to be placed at locations not shown on the drawings will be measured as the actual volume of backfill in place.

c. Special Impervious Fill. - Special impervious fill placed against concrete walls will be measured for payment as a volume on the

basis of a zone of fill 2 feet thick measured horizontally with an area equal to the actual area of contact of the fill against the wall. Special impervious fill at locations shown on the drawings against steep bedrock surfaces will be measured for payment as a volume on the basis of a zone 2 feet thick with an area equal to the projection horizontally upon a vertical plane of the surface area against which special impervious fill has been satisfactorily placed. The plane on which the projection is made will be parallel to the centerline of the conduit for measurement of special impervious fill placed against the side rock excavation slopes. Special impervious fill directed to be placed against steep bedrock faces at locations other than shown on the drawings will be measured as the actual volume in place. Special impervious fill which is placed in depressions, steps and cavities in bedrock surfaces shall be measured for payment as the total volume in place as determined by field surveys made of the foundation areas of the depressions, steps and cavities prior to filling and surveys made of the finished surfaces after filling.

d. Mortar and Concrete for Foundation Preparation. - Mortar for filling cracks and joints in the bedrock surface in areas which are required to be handcleaned and to receive compacted impervious and random fills and impervious backfill in accordance with Subparagraph 5-05b will not be measured for separate payment. All other mortar and all concrete used in the preparation of bedrock foundations in areas to receive compacted impervious and random fill and impervious backfill in accordance with Subparagraph 5-05b will be measured for payment as the actual volumes of such mortar and concrete satisfactorily placed as determined by field surveys of the areas involved made prior to and after placement of the mortar or concrete.

e. Additional Rolling. - Additional rolling for compaction will be measured for payment on the basis of the number of roller hours the compaction equipment is operated in accomplishing the compaction specified in Paragraph 5-08 of this section.

5-14. PAYMENT. - a. Compacted Fill. - Compacted fills and materials, measured as stated in Subparagraph 5-13a above, satisfactorily placed and compacted, will be paid for at the applicable contract unit prices per cubic yard for Item No. 10, "Compacted Impervious and Random Fills", Item No. 15, "Compacted Sand Fill," Item No. 13, "Compacted Gravel Fill," and Item No. 12, "Compacted Processed Sand Fill." Such payments shall constitute full compensation for all work in connection with the preparation of the foundations of the embankments (other than that specified in Subparagraph d, below), the spreading, harrowing, conditioning for moisture, compacting, removal of objectionable material, and all other incidental work required for the construction, protection, and maintenance of embankment sections exclusive of compensation for the excavation and transportation of material from required excavations and from the borrow area. Payment of contract unit prices for "Compacted Gravel Fill", "Compacted Sand Fill" and "Compacted Processed Sand Fill" shall, in addition, include all costs of furnishing acceptable material and transporting it to the locations in which it is to be placed.

b. Backfills. - Compacted backfills measured as stated in Subparagraph 5-13b above, will be paid for at the applicable contract unit prices for Item No. 11, "Compacted Impervious Backfill", and Item No. 14, "Compacted Gravel Backfill". Such payment shall constitute full compensation for all work in preparation of the foundation of contact surfaces (other than that specified in Subparagraph d below) and the spreading, conditioning, and compacting of backfill material and all other operations incidental to the placement of backfill materials. The payment of contract unit price for Item No. 14, "Compacted Gravel Backfill" shall also include compensation for furnishing acceptable gravel backfill material and transporting to the locations in which it is to be used.

c. Special Impervious Fill. - Special impervious fill will be paid for at the applicable contract unit price per cubic yard for Item No. 11, "Compacted Impervious Backfill". Such payment shall constitute full compensation for the preparation of foundations or contacting surfaces (other than that specified in Subparagraph d below) and the spreading, conditioning, compacting and all other operations incidental to the placement of the special impervious fill materials.

d. Mortar and Concrete for Foundation Preparation. - No separate payment will be made for filling and sealing open joints and cracks in the bedrock surface in accordance with Subparagraph 5-05b, payment for which will be included in the contract unit price per square (100 square feet) for Item 7, "Hand Cleaned Bedrock Surfaces". Payment for all other mortar and all concrete used in the preparation of foundations and measured as stated in Subparagraph 5-13d will be made at the established contract unit price per cubic yard of \$60.00 for Item 23A, "Concrete for Foundation Preparation". Such payments shall constitute full compensation for all labor, materials, forming, and the use of all tools and equipment required to complete the work, except the cement used in the concrete for foundation preparation which will be measured and paid for as specified cement in Section 9, CONCRETE.

e. Additional Rolling for Compaction. - Additional rolling for the compaction of fill materials will be paid for at the applicable contract unit price per equipment hour for Item No. 18, "Additional Rolling of Fill". Such payment shall constitute full compensation for all costs including hauling unit or prime mover, and shall be based on the number of hours the roller is in actual operation with no allowance for down or standby time.

SECTION 5A

HIGHWAY FILL (Item 9) (INDEX)

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SECTION 5A

HIGHWAY FILL (Item 9)

5A-01. SCOPE. - The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, and appliances, and of performing all operations in connection with the preparation of foundations for highway fills and the placement and compaction of all materials for the formation of highway fills, except as hereinafter provided, in strict accordance with the contract drawings and specifications and subject to the terms and conditions of the contract. This section does not cover the construction of fills for the construction of the dike and the relocation of Munn Road and Sutcliffe Road which are covered in Section 5, "EMBANKMENTS, DAM AND DIKE". This section does not cover backfills for culverts, drains and appurtenant structures which are covered in Section 11, "EXCAVATION, TRENCHING AND BACKFILLING FOR CULVERTS AND DRAINS".

5A-02. DEFINITION. - The term "fill" as used in this section of the specifications is defined as a mass in the permanent construction composed of specified materials which have been placed in a specified manner, the total of which forms the embankment for a highway exclusive of gravel bedding, rock slope protection, topsoil, gravel base, pavement and backfill for construction of culverts, drains and appurtenant structures. Any material specified for formation of fill is termed herein as "fill material".

5A-03. GENERAL PROVISIONS. - The highway fill sections shall be constructed to the lines, grades and cross-sections indicated on the drawings or as defined herein unless otherwise directed by the Contracting Officer. The contractor shall maintain and protect all uncompleted portions of the fill sections in a satisfactory condition at all times until final completion and acceptance of all work under the contract. Any approved fill material which is lost in transit or rendered unsuitable after being placed in a fill section and before final acceptance of the work shall be replaced by the contractor in a satisfactory manner. The contractor shall excavate and remove from sections of fill any material which the Contracting Officer considers objectionable and shall also dispose of such material and refill the excavated areas as directed, all at no cost to the Government. The contractor may be required to remove, at his own expense, any material placed outside of the prescribed slope lines.

5A-04. MATERIALS. - a. General. - The suitability of all materials covered herein shall be subject to the approval of the Contracting Officer and their disposition in the fill sections shall be as directed. The materials shall be free of muck, trees, logs, stumps, standing or

matted brush, matted roots, rubbish, and frozen materials. The use of material obtained from required stripping operations in the foundation areas of fills and embankments will not be permitted.

b. Earth Fill. - Earth fill material for use in the construction of highway fills shall consist of suitable earth or friable disintegrated rock obtained from the required unclassified excavations of the highway and dam and from the unclassified excavations in Part 1 of the borrow area, except that no material from the borrow area suitable for use as impervious fill material will be permitted in the highway fill. Earth fill material containing topsoil or humus may be used provided that such material shall be dispersed throughout the fills in such a manner that there will be no continuous or consecutive layers of such material. Earth fill material shall contain no stones larger in greatest dimension than two-thirds the thickness of the layer in which it is to be placed, except that material placed in the top foot of a fill section shall contain no stones larger than 4 inches in greatest dimension.

c. Rock Fill. - Rock fill material for use in the construction of highway fills shall consist of suitable material containing 25 percent or more, by volume, of stones or rock fragments larger than 6 inches in greatest dimension, obtained from the required unclassified and rock excavations for the relocation of Wales Road and the access road and of oversize stones removed from the earth fill materials during placement. Rockfill material shall consist principally of rock fragments of less than 24 inches in maximum dimension.

5A-05. PREPARING GROUND SURFACE FOR FILL. - Sloped ground surfaces, steeper than 1 vertical to 4 horizontal, on which highway fill is to be placed, shall be plowed, stepped, or broken up, as directed, in such manner that the fill material will bond with the existing surface. Where the existing ground surface is not to be disturbed, all stump holes and other depressions shall be filled with earth and compacted prior to placing the overlying fill materials. Where the surface of an existing roadway, including shoulders, is less than 3 feet below the top of the highway fill, the existing road and shoulders shall be spiked and scarified for the full width of the roadbed sufficiently to permit uniform shaping, compaction, and bonding between the old material and the new.

5A-06. PLACEMENT OF FILL MATERIALS. - a. General. - No earth highway fill material shall be placed in any area inundated with water. No fill material shall be placed upon a surface of frozen material nor shall snow, ice, or frozen material be incorporated in any fill section. No fill material shall be placed on previously compacted fill material, which, in the opinion of the Contracting Officer, has been affected by frost until the surface of the previously placed material has been loosened and recompacted, as hereinafter specified. No fill material shall be placed in an area within which compaction equipment is being operated. Layers of fill materials shall be placed and spread over areas

large enough to permit an orderly pattern for operating compaction equipment. Highway fills shall be constructed in longitudinal reaches or at least 200 feet except at locations where the total length of the fill is less. Temporary construction and slopes shall not be steeper than 1 vertical to 3 horizontal. The top foot of all highway fills shall be constructed of the earth fill material specified in Subparagraph 5A-04b above. The remaining portions of the fill sections may be constructed of either earth fill or rock fill materials.

b. Spreading. - (1) Earth fill materials. - After dumping, earth fill material shall be spread by bulldozers or other approved means in approximately horizontal layers over the entire fill area. The thickness of each layer before compaction shall not be more than 8 inches when compaction is done with the tamping roller nor more than 6 inches when compaction is done with a crawler-type tractor. During the dumping and spreading operations, all stones having maximum dimensions greater than two-thirds the thickness of the layer being placed or, in the top foot of a fill section, greater than 4 inches shall be removed. Oversize stones thus removed may be incorporated in rock fill layers of the highway fill. Earth fill material placed in areas which in the opinion of the Contracting Officer are too restricted for the operation of the roller or tractor and in areas where the roller or tractor are not permitted to operate shall be spread in 4-inch layers by hand shoveling.

(2) Rockfill Materials. - Rockfill materials shall be placed in horizontal lifts extending the full width of the fill section. Lift thicknesses shall not exceed two feet. Materials containing rock shall be deposited on the material being compacted and shall be uniformly spread over the preceding layers by an approved crawler-type tractor. During the spreading operations, the finer rock materials shall be spread over the rock and these materials compacted with the approved crawler-type tractor. The spreading and rolling-in of the finer materials shall continue until the interstices are completely filled with well compacted materials and the entire layer is a densely compacted mass. Individual rocks not exceeding 48 inches in greatest dimension will be permitted provided such rocks are carefully distributed, solidly bedded, and all interstices filled with densely compacted finer materials as specified above, and provided the use of such larger rocks will not interfere with the general plan for placing the materials in horizontal layers having a maximum loose thickness of 24 inches. Where sufficient fines from the rock excavation are not available to fill the interstices, earth fill material shall be used.

5A-07. MOISTURE CONTROL OF FILL MATERIALS. - The moisture contents of the highway fill materials shall be such as to prevent excessive rutting and dust and to permit satisfactory operation of the hauling and compacting equipment.

5A-08. COMPACTION OF FILL MATERIALS. - a. Equipment. - Compaction equipment shall conform to the following requirements and shall be used as prescribed in subsequent paragraphs.

(1) Tamping Rollers. - Tamping rollers shall consist of a double drum unit with a drum diameter not less than 36 inches and an individual drum length of not less than 48 inches. The drums shall be ballasted with water or sand and water. Each drum shall have staggered feet uniformly spaced over the cylindrical surface such as to provide approximately three tamping feet for each two square feet of drum surface. The tamping foot shall be 7 to 9 inches in clear projection from the cylindrical surface of the roller and shall have a face area of not less than 5 nor more than 7 inches. The roller shall be equipped with cleaning fingers, so designed and attached as to prevent the accumulation of material between the tamping feet, and the cleaning fingers shall be maintained at their full length throughout the periods of use of the roller. The weight of the roller shall not be less than 1,000 pounds per foot of linear drum length weighted. The design and operation of the tamping roller shall be subject to the approval of the Contracting Officer who shall have the right at any time during the execution of the work to direct such repairs to the tamping feet, minor alterations in the roller, and variations in the weight as may be found necessary to secure optimum compaction of the earth fill materials. At the start of compaction operations, the drums of the rollers shall be full of water. Placement of the embankment materials shall not commence unless every tamping foot of every roller to be used has a plane surface area as specified by the manufacturer of each roller. If, during the placement of fill, this plane surface area of any tamping foot on a roller becomes equal to or less than two-thirds the manufacturer's specified area, the use of the roller shall not be permitted until the plane areas of all tamping feet on the roller are restored to the manufacturer's specified area. The roller shall be pulled by a tractor of sufficient power to operate the roller at a speed of approximately 3 miles per hour.

(2) Crawler-type Tractor. - The crawler-type tractor used for the compaction of fill materials shall weigh not less than 20,000 pounds and shall exert a unit tread pressure of not less than 9 pounds per square inch.

(3) Power Tampers. - Power tampers for the compaction of earth fill materials in areas where the roller or tractor cannot operate shall be commercially manufactured pneumatic tampers approved by the Contracting Officer. Jackhammers and similar equipment not specifically designed and manufactured for the compaction of earth will not be approved.

b. Earth Fill. - After a layer of earth fill material has been satisfactorily spread, the layer shall be compacted by not less than 6 complete passes of the tamping roller or by not less than six coverages of the tread of the crawler-type tractor. A complete pass of

the tamping roller shall consist of the entire coverage of the area with one trip of the equipment. Each trip of the tamping roller shall overlap the adjacent trip by not less than two feet. In areas which are too restricted for the practicable operation of the roller or the tractor and in areas within which the roller or tractor are not permitted to operate each fill layer shall be compacted by four coverages of the foot of an approved power tamper.

c. Rock Fill. - Compaction of rock fill materials other than that incidental to the spreading operation specified in Paragraph 5A-06, above, will not be required.

5A-09. SLIDES. - In the event of slides in any part of the highway fills prior to final acceptance of the work, the contractor shall remove material from the slide areas as directed and shall rebuild such portion of the fill. In case it is determined that the slide was caused through the fault of the contractor, the removal and disposal of material and the rebuilding of the fill shall be performed without cost to the Government; otherwise, this work will be paid for at the applicable contract unit prices for borrow excavation and compacted fill.

5A-10. MEASUREMENT. - The quantity of highway fill to be paid for will be the volume computed from the applicable lines, grades, thicknesses and limits shown on the drawings, specified herein, or as directed, for the highway fill sections. The limits of fill sections which are not definite on the drawings or as stated in these specifications and which depend upon topography and field conditions shall be determined by field surveys. Measurement for highway fill will include the sections of earth fill and rock fill materials. The quantities shall not include the quantity of any fill or backfill paid for under other items.

5A-11. PAYMENT. - Highway fill measured as stated in Paragraph 5A-10 above, satisfactorily placed and compacted, will be paid for at the contract unit price per cubic yard for Item No. 9, "Compacted Highway Fill". Such payment shall constitute full compensation for all work in connection with the construction, protection and maintenance of the highway fills, exclusive of compensation for excavation and transportation of materials from required excavations and borrow area to the fill sections.

SECTION 6

ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL (Items 16, 17 and 19) (INDEX)

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SECTION 6

ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL (Items 16, 17 and 19)

6-01. SCOPE. - The work covered in this section of the specifications consists of furnishing all plant, labor, and materials, and performing all operations in connection with the construction of all sections and layers of rock slope protection, gravel bedding, and road gravel for the dam embankments, certain cut slopes and other project features in strict accordance with these specifications and the applicable drawings subject to the terms and conditions of the contract. This section does not cover base and surface courses for roads and driveways and roadway shoulders, which are covered in Section 4.

6-02. MATERIALS. - a. General. - All gravel bedding and road gravel materials shall be approved materials furnished by and at the expense of the contractor. All provisions of Section 5, "EMBANKMENTS, DAM AND DIKE", relative to contractor furnished materials shall be applicable to the gravel bedding and road gravel materials except as specified otherwise herein. The loading and hauling of any of the materials covered by this section of the specifications shall be performed in a manner which will prevent segregation and will assure placement of well-graded materials. Rock slope protection materials shall be placed directly in the rock slope protection layers and sections after processing without stockpiling.

b. Rock Slope Protection. - Rock slope protection material shall consist of hard, durable and sound stone or rock fragments obtained from the required rock excavations, processed as specified herein, and of oversize stones removed during placement of fill materials in the embankments. All loose earth shall be removed from oversize stones prior to placement in the rock slope protection layers and sections. The material obtained from the required rock excavations shall be processed to produce a well-graded material between the maximum size particle specified and the minimum size particle specified. The maximum size particle specified shall be that which can be placed in the layer or lift specified except that the volume of the maximum size stone shall not exceed 1/2 cubic yard. The larger size rock blocks shall be broken by secondary blasting. The minimum size particle specified shall be the smallest size fragment which will not pass a 6-inch bar grizzly. The processed rock slope protection material may contain up to 10 percent by weight of particles smaller than that specified above. Rock blocks for turnaround shall be 2' x 2' x 2' and placed as shown on the drawings.

c. Gravel Bedding. - Gravel bedding material shall be approved material consisting of reasonably well-graded bank-run sandy gravel or gravelly sand furnished by and at the expense of the contractor. Gravel bedding material shall conform to the following gradation requirements:

(1) The material shall contain no individual stone with a maximum dimension greater than 12 inches nor greater than one-half the thickness of the gravel bedding layer to be placed, whichever is less. The material shall not contain more than 50 percent, by dry weight, of stones larger than 3 inches in maximum dimension.

(2) Of the component of the material passing the 3-inch U. S. Standard Sieve, at least 25 percent and no more than 60 percent, by dry weight, of the particles shall pass the No. 4 U. S. Standard Sieve.

(3) Of the component of the material passing the No. 4 U. S. Standard Sieve, not more than 15 percent, by dry weight, of the particles shall pass the No. 200 U. S. Standard Sieve.

d. Road Gravel. - Material for road gravel shall be approved material consisting of natural bank-run, well-graded, sandy gravel or gravelly sand furnished by and at the expense of the contractor and meeting the following gradation requirements:

| <u>U. S. Standard Sieve Size</u> | <u>Percent Passing by Dry Weight</u> |
|--------------------------------------|--|
| 3-inch | 100 |
| No. 4 | 30-60 |
| No. 200 | 2-10 |

6-03. FOUNDATION PREPARATION. - a. Embankment Foundation Areas. - The foundation areas of the dam embankment and highway fills upon which rock slope protection and gravel bedding are to be placed shall be stripped and prepared as specified in Section 3, EXCAVATION. No material shall be placed in any foundation area until the area has been inspected and approved by the Contracting Officer.

b. Surface Base Areas. - The surface areas of embankment sections of impervious, random, sand, gravel, and processed sand fills, highway fill and gravel bedding and areas produced by excavations outside of the limits of the foundations of the embankments, all upon which gravel bedding or rock slope protection materials are to be placed, shall be trimmed to conform to the lines and grades shown on the drawings, except as otherwise stated herein. The surface areas of embankment sections may have a tolerance of 4 inches in limited portions from the lines and grades shown on the drawings. Where surface base areas of natural earth or embankment sections of impervious, random, sand gravel, and processed sand fills are below the lines and grades shown on the drawings, the low areas shall be brought to grade either by (1) filling with material similar to the base material and placed and compacted, as directed, with pneumatic tampers or crawler-type tractors, or (2) by filling with the material to be placed on the area, and no additional payment will be made for any material or work thus required.

Immediately before the placing of any material, the prepared base shall be inspected and no material shall be placed thereon until the areas have been approved.

c. Subgrade for Road Gravel. - The entire subgrade surface, for road gravel, shall be compacted by 6 coverages of the tread of a crawler-type tractor or by other approved means. After compaction, the surface of the subgrade shall show no deviation in excess of 2 inches from the grades indicated on the drawings. No road gravel shall be placed on any subgrade area until the area has been inspected and approved by the Contracting Officer.

6-04. ROCK SLOPE PROTECTION. - a. General. - Rock slope protection material, as specified in Paragraph 6-02 of this section, shall be used to construct the rock slope protection layers and sections of the dam embankment, highway fills, on certain cut slopes, and at other locations indicated on the drawings. The furnishing and placing of rock blocks at turnaround is included under rock slope protection. No rock slope protection material shall be placed against concrete structures until the concrete has been in place at least 14 days. In placing the rock against concrete structures, care shall be taken to protect the concrete.

b. Placement. - Rock slope protection material shall be placed in such a manner as to produce a mass of rock with the minimum practical percentage of voids. The rock slope protection layers shall be constructed to the lines and grades shown on the drawings. A tolerance of plus or minus 6 inches from the slope lines and grades shown on the drawings will be allowed in the finished surface of the rock slope protection layers, except that either extreme of such tolerance shall not be continuous over an area greater than 200 square feet. Placement shall be in a manner which will not cause segregation of the particles and which will avoid displacement of gravel bedding materials. Placement by dumping into chutes, pushing by bulldozers, or by other methods likely to cause segregation, will not be permitted. The larger rock fragments shall be well distributed in the entire mass and the finished rock slope protection layers shall be free from segregation, objectionable pockets of small stones, and clusters of larger rock fragments. Oversize stones obtained from embankment fill materials and other materials shall be placed so that they will not appear on the finished surfaces of the rock slope protection layers. Rearranging of individual stones by hand or by mechanical equipment will be required to the extent necessary to obtain good distribution of stone sizes and to shape the surface within the specified tolerances and to obtain a uniform appearance throughout. Rock slope protection layers with horizontal widths greater than 10 feet shall be constructed in horizontal lifts of no more than 3 feet in thickness. Elsewhere rock slope protection material shall be placed to its full course thickness in one

operation. No bulldozer or similar equipment will be permitted to operate on the outer surfaces of rock slope protection layers. Placement of rock slope protection material on the dam embankment shall not lag behind by more than 3 feet measured vertically nor precede the placement of adjacent gravel bedding material. Voids in the surface of the rock slope protection layers within the limits of the 16-foot service road on the upstream face of the dam shall be filled prior to placement of road gravel with rock spalls or rock screenings produced in the preparation of rock slope protection. During the construction of the upstream rock slope protection layer on the dam embankment in the vicinity of the outlet works, provisions shall be made for the later installation of the bubble gage conduit and air vent. A trench shall be left open at the surface of the rock slope protection as shown on the drawings. Rock slope protection material shall be placed along the trench in such a manner that rock slope protection material may be placed later in the trench.

c. Measurement. - The quantity of rock slope protection to be paid for will be measured as the total volume computed from the lines, grades, thicknesses, and limits shown on the drawings or as modified by the Contracting Officer. The lower limits of the rock slope protection layers which are not definite on the drawings and depend upon field conditions and topography will be determined by a survey made immediately prior to placement of rock slope protection material. Each rock block placed at turnaround will be considered for payment purposes as measuring 8 cubic feet.

d. Payment. - Payment for rock slope protection will be made at the contract unit price per cubic yard for Item 19, "Rock Slope Protection". Such payment shall constitute full compensation for handling, cleaning, sorting, processing (including grizzlyng), loading of processed material and hauling thereof to the permanent work, the loading of rock screenings and the hauling thereof to the permanent work or to the spoil areas, and placing of rock slope protection material, the shaping, grading, and working the outer surfaces including placement of rock screening on the outer surfaces beneath the service road, the breaking of oversize rock blocks, and all other work incidental to the construction of rock slope protection layers, exclusive of excavation, stockpiling, rehandling from stockpiles, hauling to processing plant, and all other work for which payment is made in accordance with Section 3, "EXCAVATION" and Section 5, "EMBANKMENTS - DAM AND DIKE". Furnishing and placing rock blocks at turnaround will be paid for under Item 19. Payment for the placement of rock slope protection material in the trench for the bubble gage conduit and the finishing of the rock slope protection surface in the trench area shall be included in the contract lump sum price for Item 27, "Bubble Gage Shelter".

6-05. GRAVEL BEDDING. - a. General. - Gravel bedding material as specified in Paragraph 6-02 of this section shall be placed to the lines, grades, thicknesses and limits shown on the drawings or as directed by the Contracting Officer to form the gravel bedding layers.

b. Placement. - Gravel bedding material shall be placed and spread uniformly on the prepared base, in a satisfactory manner, to provide a layer with the thickness shown on the drawings or as directed. Placing of material by methods which will tend to segregate particle sizes within the layer will not be permitted. Any damage to the surface of the gravel bedding prior and during placing of rock slope protection materials shall be repaired before proceeding with the work. Compaction of the gravel bedding will not be required but it shall be finished to present a reasonably even surface free from mounds or windrows. Placement of gravel bedding on slopes of the dam embankment sections shall not precede the placement of adjacent embankment fill material nor shall it lag behind by more than 5 feet measured vertically. During the placement of the gravel bedding on the upstream slope of the dam embankment in the vicinity of the outlet works, provisions shall be made for the later installation of the bubble gage conduit. In no case shall the gravel bedding that is to be placed after the installation of the bubble gage conduit be stockpiled on the completed portions of rock slope protection.

c. Measurement. - The quantities of gravel bedding to be paid for will be measured as the volumes computed from the respective lines, grades, thicknesses, and limits shown on the drawings or as directed by the Contracting Officer. The lower limits of the gravel bedding which are not definite on the drawings and which depend upon field conditions and topography shall be determined by surveys.

d. Payment. - Payment for gravel bedding will be made at the contract unit price per cubic yard for Item 16, "Gravel Bedding". Such payment shall constitute full compensation for furnishing, hauling, placing of gravel bedding, maintenance of the layers, preparation of foundations, and all other work incidental to the construction of the gravel bedding specified. No payment will be made for excess thicknesses of gravel bedding layers nor for material required to replace foundation material lost by rain wash, wind erosion, or otherwise, except for additional gravel bedding material ordered in writing by the Contracting Officer. Payment for the placement of gravel bedding in the trench area for the bubble gage conduit shall be included in the contract lump sum price for Item 27, "Bubble Gage Shelter".

6-06. ROAD GRAVEL. - a. General. - Road gravel material as specified in Paragraph 6-02 above, shall be placed to the lines, grades, thicknesses and limits indicated on the drawings or as directed by the Contracting Officer to form the road gravel section of the road across the top of the dam embankment and of the service road.

b. Placement. - After the subgrade is prepared in accordance with the provisions in Paragraph 6-03 above, the road gravel section shall be constructed by spreading the material in layers not exceeding 6 inches in thickness. The material as spread shall be well graded with

no pockets of fine material nor segregation of coarse and fine particles. After spreading, each layer shall be compacted with at least 6 coverages of the tread of a crawler type tractor weighing at least 20,000 pounds. The final surface of the road gravel shall be graded to provide a smooth even surface. In areas adjacent to the bubble gage shelter, the road gravel shall be compacted using a surface vibrator as specified in Paragraph 5-08a. The contractor shall maintain the final surface in a satisfactory condition until final completion and acceptance of all work under the contract.

c. Measurement. - The quantity of road gravel to be paid for will be measured as the volume computed from the thicknesses and limits indicated on the drawings or as modified by the Contracting Officer.

d. Payment. - Road gravel will be paid for at the contract unit price per cubic yard for Item 17, "Road Gravel". Such payment shall constitute full compensation for furnishing, hauling, placement, compaction, grading, and all other work incidental to the construction and maintenance of road gravel layers as specified.

SECTION 7
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SECTION 7

FOUNDATION DRILLING AND GROUTING (Item 8)

7-01. GENERAL. - a. Scope. - This section of the specifications covers drilling exploratory holes; drilling drain holes; drilling, washing and pressure testing grout holes; making grout connections; furnishing, handling, transporting, storing, mixing and injecting the grouting materials; providing insulated pipe lines and a warmed enclosure for the grout plant to facilitate effective placement of grout during freezing weather; patching the finished grout holes; care and disposal of drill cuttings, waste water and waste grout; clean-up of the areas upon completion of the work and all such other operations as are incidental to the drilling and the grouting.

b. Program. - The work contemplated consists of constructing a grout curtain beneath the dam and spillway weir, the approximate locations, limits, and details of which are indicated on the contract drawings. All grouting shall be done from natural and excavated bedrock surfaces except for holes at the intersection of the cut-off trench and outlet works where field conditions or construction progress may require grouting through the concrete leveling course. The program shown on the drawings and described herein is tentative and is presented for the purpose of canvassing bids. The amount of drilling and grouting which actually will be required is unknown, and will be governed by conditions encountered as the work progresses. The grouting program will be initiated following cleanup of any area of the rock surface or surfaces of rock excavated to design grades as approved by the Contracting Officer. Cleanup shall be made in accordance with Paragraph 3-07 h. In no case will grouting be allowed closer than 50 feet to an area in which rock excavation or overburden excavation has not been completed to grade in order to facilitate the observation and calking of grout leaks.

c. Procedures. - Grouting mixes, pressures, the pumping rate and the sequence in which the holes are drilled and grouted will be determined in the field and shall be as directed.

7-02. EQUIPMENT. - a. General. - All drilling and grouting equipment used shall be of a type, capacity and mechanical condition suitable for doing the work, as determined by the Contracting Officer. The power and equipment and the layout thereof shall meet all applicable requirements of local, State, and Federal regulations and codes, both safety and otherwise.

b. Drilling Equipment. - Standard drilling equipment of the rotary, water circulating, diamond core drilling type shall be used to perform the drilling as specified in Paragraphs 7-04d through 7-04f.

c. Grouting Equipment. - The grout plant shall be capable of supplying, mixing, stirring and pumping the grout, to the satisfaction of the Contracting Officer. The plant shall have a minimum capacity of 30 g.p.m. of grout injected at a pressure not greater than 40 p.s.i. It shall be maintained in first-class operating condition at all times and any grout hole that is lost or damaged due to mechanical failure of equipment or inadequacy of grout supply shall be replaced by another hole, drilled by the contractor at his expense.

7-03. GROUTING MATERIALS. - a. Composition. - Grout will be composed of water and cement except when mortar grout is required as specified in Paragraph 7-05 f. The grout mixes will be designed by the Contracting Officer and will be varied to meet the characteristics of each hole as determined by conditions encountered. The various materials to be furnished by the contractor shall conform to the specifications listed in subparagraphs b, c, and d, below.

b. Water. - The water used in the grout shall be furnished by the contractor. It shall be fresh, clean and free from injurious amounts of sewage, oil, acid, alkali, salts, or organic matter.

c. Cement. - Cement used in grout shall conform to Paragraph 9-04b. The use of bulk cement will be permitted provided the contractor employs methods of handling, transporting, and storage that are satisfactory to the Contracting Officer; otherwise, only cement furnished in cloth or paper bags will be accepted to use in the work. A sufficient quantity of cement shall be stored at or near the site of the work to insure that grouting operations will not be delayed by shortage of cement. In the event the cement is found to contain lumps or foreign matter of a nature and in amounts which, in the opinion of the Contracting Officer, may be deleterious to the grouting operations, screening through a standard 100-mesh screen may be required. No payment will be made for such screening.

d. Sand. - Sand for grout shall consist of hard, tough, durable, uncoated particles. It may be composed of natural sand, manufactured sand, or a combination of natural and manufactured sand. The shape of the particles shall be generally rounded or cubical and shall not contain more than 15 percent of flat or elongated pieces having a maximum dimension in excess of five times the minimum dimension. If the sand is a combination of separately processed sizes or classification, or is a combination of natural and manufactured sands, the different components shall be batched separately or, subject to written approval, blended prior to delivery to the mixing plant. The sand shall be well graded from fine to coarse and the gradation, as determined in accordance with ASTM Designation C136-63, for "Sieve or Screen Analysis of Fine and Coarse Aggregates" shall conform to the following requirements:

Sieve Designation
(U.S. Std. Square Mesh)

Cumulative Percentage by Weight
Passing Retained

| | | |
|-----|--------|--------|
| 8 | 100 | 0 |
| 16 | 95-100 | 0-5 |
| 30 | 60-85 | 15-40 |
| 50 | 20-50 | 50-80 |
| 100 | 10-30 | 70-90 |
| 200 | 0-5 | 95-100 |

In addition to the grading limits shown above, all sand used in the work shall have a fineness modulus within the range of 1.50 to 2.00. The grading of the sand as delivered to the mixer, during any 24-hour period of operation, shall be controlled so that the fineness moduli of samples taken will not vary more than 0.10 \pm from the average fineness modulus. The results of previous tests and the service record may be used to determine the acceptability of the sand. In the event previous tests and a service record are meager or not available, as in the case of newly operated sources, or are not satisfactory, the sand shall be subjected to such tests as are necessary to determine its acceptability. All sampling of sand shall be in accordance with the applicable sampling provisions contained in Federal Specification SS-R-406c(1)(Part 2) for "Road and Paving Materials; Methods of Sampling and Testing," or as directed. Unless otherwise directed, all test samples shall be taken under the supervision of the Contracting Officer and shall be delivered to a designated point, at the expense of the contractor, at least 60 days in advance of the time when sand will be required at the site of the work. All tests will be made by the Government at its expense. The tests to which the sand will be subjected will include specific gravity, absorption, soundness in magnesium sulphate, petrographic analyses, and any other tests that are necessary to demonstrate that mortar of adequate durability can be produced. The percentage of surface moisture in terms of the saturated surface-dried sand will be determined in accordance with ASTM C70-47 for "Standard Method of Test for Surface Moisture in Fine Aggregate", or other method giving comparable results. Sand shall be stored in such a manner as to avoid inclusion of any foreign materials in the grout. The storage piles shall be constructed so as to prevent segregation. All sand shall remain in free draining storage for at least 72 hours prior to use.

7-04. GROUT, DRAINAGE AND EXPLORATORY HOLES. - a. General. - All holes for grouting, drainage, or exploration shall be drilled at the locations, in the direction and to the depths shown on the drawings or as directed by the Contracting Officer. The first series of holes to be drilled and grouted shall be at intervals shown on the drawings and hereinafter are referred to as primary holes. The location of secondary and succeeding series (intermediate) holes shall be determined by the split

spacing method as defined in Subparagraph 7-05a(4). The number of grout holes shall be increased progressively, by the split spacing method as deemed necessary by the Contracting Officer until the amount of grout used indicates that the foundation is tight. The use of grease, "rod dope", or other lubricant on rotary drill rods will not be permitted. Each hole drilled shall be protected from becoming clogged or obstructed by means of a cap or other suitable device on the collar and any hole that becomes clogged or obstructed before completion of operations shall be cleaned out in a manner satisfactory to the Contracting Officer or another hole provided by and at the expense of the contractor. That portion of drain holes which penetrates concrete shall be formed by embedding pipes in the concrete at the time of its placement, and no payment will be made for such partial depth of holes. Cost of furnishing and placing pipe shall be a subsidiary obligation included under the applicable contract price for drilling the holes.

b. Pipe for Foundation Grouting. - All metal pipe and fittings required for constructing grout, and exploratory holes shall be furnished, cut, threaded, fabricated and embedded by the contractor. The pipe shall conform to Fed. Spec. WW-P-406b for "Pipe; Steel, (Seamless and Welded (for Ordinary Use))" Weight A, Class 1. The fittings shall be malleable iron Type I in accordance with Fed. Spec. WW-P-521d & Am-1 for "Pipe-Fittings, Malleable Iron, Wrought Iron and Steel (screwed) 150-pound." Pipe will be black steel of the diameter and in the location indicated on the drawings. The pipe and fittings shall be cleaned thoroughly of all dirt, grease, oil, grout and mortar immediately before embedment. All joints shall be made up snug and the assembly held firmly in position and protected from damage or displacement until grouting is completed. The contractor shall take all necessary precautions to prevent any pipe from becoming clogged or obstructed from any cause and any pipe which becomes clogged shall be cleaned out in a manner satisfactory to the Contracting Officer at the contractor's expense. The presence of tramp metal such as nails, wire, bolts, nuts and other foreign material in the pipes through which diamond drilled holes are to be drilled shall be considered as obstructions. No separate payment will be made for the pipe and fittings as it will be considered a subsidiary obligation included under the applicable contract price for drilling the holes.

c. Pipe for Foundation Drains. - Asbestos cement pipe required for constructing drainage holes shall be furnished, cut, and embedded by the contractor. The pipe shall conform to Federal Specification SS-P-351a, "Pipe Cement Asbestos", Class 150. Pipe will be of the diameter and in the locations indicated on the drawings. The pipe shall be cleaned thoroughly of all dirt, grease, oil, grout and mortar immediately before embedment, and should be held firmly in position and protected from damage or displacement while the concrete is being placed. The contractor shall take all necessary precautions to prevent any pipe from becoming clogged or obstructed from any cause, and any pipe which becomes clogged shall be cleaned out in a manner satisfactory to the Contracting Officer at the contractor's expense.

The presence of tramp metal such as nails, wire, bolts, nuts and other foreign material in the pipes through which holes are to be drilled shall be considered as obstructions.

d. Grout Hole Drilling. - Grout holes shall be drilled with standard rotary, water circulating, diamond core drilling equipment. No core recovery will be required and the type bit used shall be optional with the contractor. The minimum diameter of hole shall be 1-1/2 inches at the point of maximum penetration. No grout hole will be drilled at an angle greater than 45 degrees measured from the vertical nor to a depth greater than 40 feet measured from the collar of the hole. If, as the work progresses, it is determined that holes to depths greater than indicated in the bid schedule are necessary, drilling to such greater depth will be ordered in writing, and the drilling to depths in excess of 40 feet will be paid for at a negotiated unit price. Drilling will be done in accordance with the "Stage Grouting, Split Spacing" method hereinafter described. Whenever the drill water is lost, or artesian flow is encountered, the drilling operations shall be stopped and the hole grouted before drilling operations are resumed in such hole. The grout so injected remaining in a partially completed hole shall be removed therefrom by washing or other methods before it has set sufficiently to require redrilling. Redrilling required because of the contractor's failure to clean out a hole before the grout has set shall be performed at the contractor's expense except that where the grout has been allowed to set by direction of the Contracting Officer, the redrilling will be paid for at the rate of 50 percent of the schedule price for drilling the grout hole.

e. Drain Hole Drilling. - Drainage holes shall be drilled into the dam foundation through pipes embedded in the concrete for this purpose. Drain holes shall be drilled with standard rotary, water circulating, diamond core drilling equipment, but no core recovery will be required and the contractor may use coring or noncoring bits as he may elect. The minimum diameter of hole shall be 2-7/8 inches measured at the point of maximum penetration. Drain holes shall be drilled at angles and to depths as indicated on the drawings unless otherwise specified or changed by the Contracting Officer due to conditions determined after the rock is exposed by construction operations. If as the work progresses, it is determined that holes to depths greater than indicated are necessary, drilling to such greater depth will be ordered in writing by the Contracting Officer, and drilling to depths in excess of 15 feet for 3-inch drain holes will be paid for at negotiated prices. All drain holes will be thoroughly washed after completion of drilling to remove all drill cuttings and slurry by applying water and air to the bottom of the hole and returning the water through the hole to the surface. Drain holes shall not be drilled without the written approval of the Contracting Officer in any location until all adjacent grout holes within a minimum distance of 150 feet have been drilled and grouted to full depth.

f. Exploratory Hole Drilling. - The contractor shall perform such exploratory drilling as may be required to determine the condition of the rock prior to grouting or the effectiveness of the grouting operations after grouting. Exploratory drilling may also be required in areas of structure foundations where other drilling or grouting is not planned. All exploratory drilling shall be performed with rotary, water circulating, diamond core drilling equipment using coring type bits. Since the maximum recovery of unpredictable soft or friable materials is of prime importance, the contractor shall use a standard ball bearing, swivel type, double tube core barrel equipped with diamond set core bits and standard core lifters, similar in construction and equal in performance to the Sprague and Henwood "M" series. The amount of, and the requirement for, exploratory drilling will be as directed. The NX holes may be required to be drilled to varying depths, with a maximum depth of 50 feet. Special care should be exercised to obtain cores in as good condition as possible from all holes capable of producing satisfactory cores. The contractor shall keep, in a manner satisfactory to the Contracting Officer, and furnish to the Contracting Officer an accurate Driller's Log of all exploratory holes drilled. The log shall include a non-technical description of all materials encountered in the drilling, their location in the holes and the location of special features such as seams, open cracks, soft or broken rock, points where abnormal loss or gain of drill water occurred, and any other items of interest in connection with the purpose for which the exploratory drilling is required. Wooden core boxes will be furnished by the Government, and the contractor shall place the cores in the boxes in the correct sequence and separated accurately by wooden blocks, according to the measured distances in the holes. No box shall contain cores from more than one hole. The covers shall be fastened securely to the core boxes and the boxes shall be delivered in the vicinity of the work as directed by the Contracting Officer. Exploratory holes may be grouted under pressure, if conditions so indicate, but in all such cases the holes will be grouted to full depth in one operation and the contractor will not be required to remove the grout from any part of the hole.

7-05. DEFINITIONS AND PROCEDURES FOR DRILLING AND GROUTING. -

a. General. - The drilling and the grouting shall be done by zones, using the split spacing, stage grouting method as described herein.

(1) Zone. - A zone is a predetermined partial depth of curtain. The first zone extends 15 feet downward from the rock surface except at the spillway weir where it extends downward 10 feet from foundation grade. At the weir and between Stations 1+25 and 3+50 along the cut-off trench this zone constitutes the full depth of the grout curtain. A second zone extends 10 feet downward from the bottom of the first zone between Stations 3+50 and approximately 7+15. It is anticipated that hole spacing will average 10 feet in both the first and second zones, for the grout curtain under the dam and 5 feet at the spillway weir. However, these spacings will be varied in accordance with conditions encountered and as directed. In general, all grouting in a given zone and section will be finished before work is started in the next underlying zone.

(2) Section. - A section is a reach along the grout curtain, not more than 50 feet in length in which grouting operations will not be permitted at the same time that drilling is in progress. Insofar as practicable the grout curtain will be subdivided into sections in a manner which will facilitate the contractor's operations.

(3) Stage. - A stage is a partial or complete depth of hole within any given zone. The actual depth of a stage depends upon geologic conditions encountered in drilling. It may vary from a fraction to the full depth of the zone, and is marked by the loss or gain of drill water in appreciable amounts.

(4) Split Spacing. - Split spacing is the procedure of locating an additional grout hole midway, between two previously drilled and grouted holes.

b. Stage Grouting. - Stage grouting is a complete cycle of drilling, washing, and grouting of any portion of a hole within a given zone. It involves the placement of a grout curtain by drilling and grouting in successive operations in accordance with the following general procedure.

(1) Primary holes for foundation grouting shall be drilled to comparatively shallow depths within the first zone. The depths will be governed by the foundation conditions.

(2) The holes thus drilled shall be washed and pressure tested, and then grouted, except that when pressure testing indicates a relatively tight hole, the Contracting Officer may direct that the grouting of that hole be omitted for that stage and the hole be left open for drilling and grouting of the next stage.

(3) After the grouting of any hole, the grout within the hole shall be removed by washing or by other methods before it has set sufficiently to require redrilling.

(4) After the interval of time as specified in Paragraph 7-05d(2), the primary holes not already drilled to the limit of the first zone shall be drilled as directed to additional depths not exceeding the zone limit.

(5) The primary holes thus deepened shall again be washed and pressure tested and then grouted at higher pressures as directed.

(6) Again, the grout within the hole shall be removed as described above.

(7) The process of successively drilling primary holes to additional depths and grouting at higher and higher pressures in stages, as directed, shall be repeated until all of the first set of holes on the

maximum spacing (see Paragraph 7-04a) have been completely drilled and grouted to the depth of the first zone over such section of the grout curtain as may be directed.

(8) After the primary holes in the first zone have been completed in any section as specified above, the second and succeeding series of holes, as determined by the "split spacing method", shall be drilled and grouted to the depth of the first zone in like manner until the first zone of that section is completely grouted as directed.

(9) The process of successively drilling to additional depths and grouting at higher and higher pressures in stages for the first series of holes and then for succeeding series of holes shall be repeated for the second zone of that section. Other sections along the grout curtain shall be grouted in like manner until grouting of the foundation is completed to the satisfaction of the Contracting Officer. As the drilling and grouting work progresses, it may develop that conditions are such that all or parts of the foundation already grouted require additional grouting. In such event, the equipment shall be returned and additional holes for grouting shall be drilled and grouted as directed and no additional allowance above the contract prices will be made for drilling and grouting such holes or for the expense of any movement of equipment necessary to the performance of such work.

c. Washing and Pressure Testing. - Immediately before the pressure grouting of each stage of any hole is begun, the hole shall be thoroughly washed under pressure and pressure tested. All intersected rock seams and crevices containing clay or other washable materials shall be washed with water and air under pressure to remove as much of these materials as possible. If practicable, as determined by the Contracting Officer, such material shall be ejected from one or more holes by introducing water and air under pressure into an adjacent hole. In no case shall such pressure exceed the maximum grouting pressure as directed. All grout holes shall be tested with clean water under continuous pressure up to the required grouting pressure as directed. All holes sufficiently tight to build up the maximum required pressure shall be washed at such pressure and the washing shall continue as long as there is any increase in the rate at which water is taken, such increase indicating that fractures are being opened by the washing operation. Open holes in which no pressure can be built up shall be washed for a period of 5 minutes, with the pump operating at full capacity, or for such period of time as fracture-filling is being removed, as evidenced by the escape of muddy water through surface openings or other grout holes.

d. Stage Grouting Procedures. - (1) First Stage. - The contractor shall perform the first stage, or low-pressure, shallow-curtain grouting by washing and grouting holes at locations indicated on the drawings or directed, using the "split spacing" method described in Paragraph 7-05a(4). Before grouting is begun in any hole of a given series in any section, at least the nearest two holes in advance of each such hole in that series shall be completely drilled for the same stage.

and the adjacent hole completely washed to facilitate washing and flushing out of any intervening clay-filled seams, fractures, or solution channels.

(2) Second Stage. - After all first stage grouting in any section has been completed, as specified above, the contractor shall proceed, when so directed, with second stage drilling and grouting in accordance with the procedure outlined herein but in no case shall the deepening of any hole preparatory to grouting be commenced before a minimum period of 24 hours has elapsed since completion of the previous stage-grouting at that hole; nor shall second stage grouting be conducted within a distance of approximately 100 feet of any hole in which a previous stage of grouting has been completed until the grout in such previous stage hole has set for a period of 24 hours. Grouting at subsequent stages shall conform to the same requirements as to minimum time and distance.

e. Grouting Pressures. - Grouting pressures to be used in the work will vary with conditions encountered in the respective holes and pressures used shall be as directed. In general, an increase in pressure proportionate to the depth of hole applied from the top of the hole will be required. Under any condition, the maximum grouting pressure in any part of the work shall be limited to that which, as determined by the Contracting Officer, will not lift or otherwise move any part of the foundation of adjacent structures. In no event will pressures in excess of 40 p.s.i. be required.

f. Grouting. - All pressure grouting operations shall be performed in the presence of the Contracting Officer, and shall be in accordance with the following general procedures.

(1) Grout Mixes. - Mixes shall be in the proportions directed by the Contracting Officer who will, from time to time, direct changes to suit the conditions found to exist in the particular grout hole. The water-cement ratio by volume will be varied to meet the characteristics of each hole as revealed by the grouting operation and will range between 3.0 and 0.6; the greater part of the grout probably being placed at a ratio of about 1.0. The types of grout shall be as follows:

(a) Neat Cement Grout shall consist of cement and water.

(b) Mortar grout shall consist of cement, sand, and water.

(2) Grout Injection. - In general, if pressure tests indicate a tight hole, grouting shall be started with a thin mix. If an open hole condition exists, as determined by loss of drill water or inability to build up pressure during washing operations, then grouting shall be started with a thicker mix and with a grout pump operating as nearly as practicable at constant speed at all times; the ratio will be decreased,

if necessary, until the required pressure has been reached. If this procedure does not produce the desired pressure, mortar grout shall be used and the mix varied as necessary to produce the desired results. When the pressure tends to rise too high, the water-cement ratio shall be increased and/or the mix of mortar grout changed or discontinued as may be required to produce the desired results. If necessary to relieve premature stoppage, periodic applications of water under pressure shall be made. Under no conditions shall the pressure or rate of pumping be increased suddenly as either may produce a water-hammer effect which may promote stoppage. The grouting of any hole shall not be considered complete until that hole refuses to take any grout whatever at three-fourths of the maximum pressure required for that stage. Should grout leaks develop, the contractor shall calk such leaks when and as directed, the cost thereof being included in the contract price for Item, "Placing Grout".

If, due to size and continuity of fracture, it is found impossible to reach the required pressure after pumping a reasonable volume of grout at the minimum workable water-cement ratio or mortar grout with the maximum volume of sand at the minimum water-cementing materials ratio the speed of the pumping shall be reduced or pumping shall be stopped temporarily and intermittent grouting shall be performed, allowing sufficient time between grout injections for the grout to stiffen. Following such reduction in pumping speed, if the desired result is not obtained, grouting in the hole shall be discontinued when directed. In such event, the hole shall be cleaned, the grout allowed to set, and additional drilling and grouting shall then be done in this hole or in the adjacent area as directed, until the desired resistance is built up.

After the grouting of any stage of a hole is finished, the pressure shall be maintained by means of a stop-cock or other suitable device until the grout has set to the extent that it will be retained in the hole. Grout that cannot be placed, for any reason, within 2 hours after mixing shall be wasted. If such grout is mixed at the direction of the Contracting Officer or with his knowledge and consent, such wasted grout except as specified in Paragraph 7-06a shall be paid for at the contract unit prices for the materials contained therein.

(3) Equipment Arrangement and Operation. - The arrangement of the grouting equipment shall be such as to provide a continuous circulation of grout throughout the system and to permit accurate pressure control by operation of a valve on the grout return line, regardless of how small the grout take may be. The equipment and lines shall be prevented from becoming fouled by the constant circulation of grout and by the periodic flushing out of the system with water. Flushing shall be done with the grout intake valve closed, the water supply valve open, and the pump running at full speed.

(4) Protection to Work and Cleanup. Except as otherwise specified, no grouting will be permitted within 100 feet of installed perforated pipe or gravel filters for foundation drains. Where permitted

in such locations, the contractor shall maintain a flow of water through the drains likely to be affected, to serve as tell-tales. In case leakage of grout into drains does occur the contractor shall immediately stop the grouting operations and shall remove all grout from the drains affected by washing to the satisfaction of the Contracting Officer, and no separate payment will be made for such work. Such stopping of grouting operations and washing of drains shall be repeated as often as required to complete the curtain grouting. During grouting operations the contractor shall take such precautions as may be necessary to prevent drill cutting, equipment exhaust oil, wash water, and grout, from defacing or damaging any permanent structure. The contractor will be required to furnish such pumps as may be necessary to care for waste water and grout from his operations. The contractor shall, upon completion of his operations, clean up all waste resulting from his operations that is unsightly or would interfere with the efficient operation of the project as anticipated by the original design.

g. Records. - The Contracting Officer will keep records of all grouting operations, such as a log of the grout holes, results of washing and pressure testing operations, time of each change of grouting operation, pressure, rate of pumping, amount of cement for each change in water-cement ratio, and other data as deemed by him to be necessary. The contractor shall furnish all necessary assistance and cooperation to this end.

h. Communications. - When, for his own convenience, the contractor has the individual elements of his plant so located that communication by normal voice between these elements is not satisfactory, the Contracting Officer may require him to install a satisfactory mechanical means of communication, such as a telephone or other suitable device.

7-06. MEASUREMENT AND PAYMENT. - a. General. - The contract prices for the various items of work and materials, as described in Paragraphs 7-06b through 7-06i, shall constitute full compensation for mobilizing, demobilizing and furnishing all equipment necessary to perform the drilling and grouting of the structure in accordance with these specifications; all drilling, washing and pressure testing of grout holes, care and disposal of waste water and waste grout, clean-up of the site, furnishing, handling, transporting and storing of grout materials, and for furnishing all labor and supplies incidental to the work. No payment will be made for grout, or the material constituents thereof, wasted due to improper anchorage of grout pipe or connections, or which is wasted due to negligence on the part of the contractor, nor for grout which is rejected by the Contracting Officer because of improper mixing. Payment will be made at the applicable contract unit prices for materials contained in grout which are wasted, where the wasting is not due to negligence on the part of the contractor.

b. Mobilization and Demobilization. - The cost of assembling all plant and equipment at the site preparatory to initiating the work and for removing it therefrom when the drilling and grouting program has

been completed, will be made at the established contract lump-sum price for Item 8a, "Mobilization and Demobilization". Sixty percent of the contract lump-sum price will be paid following completion of moving onto the site, including complete assembly in working order, of all equipment necessary to perform the required drilling and grouting operations. The remaining 40 percent of the contract lump-sum price will be paid when all equipment has been removed from the site.

c. Drilling Grout Holes. - Drilling of grout holes will be measured for payment on the basis of the linear feet of holes actually drilled in concrete or rock, as shown on the drawings or as directed. Payment for drilling grout holes will be made at the contract price per linear foot for Item 8b, "Drilling 1-1/2" (EX) Grout Holes."

d. Drilling Drain Holes. - Drilling of drain holes will be measured for payment on the basis of the linear feet of holes actually drilled in rock, as shown on the drawings or as directed. Payment for drilling drain holes will be made at the contract price per linear foot for Item 8c, "Drilling 3" (NX) Drain Holes", and shall include all costs in connection with furnishing and installing all required asbestos-cement pipe.

e. Drilling Exploratory Holes. - Drilling of exploratory holes will be measured for payment on the basis of the linear feet of holes actually drilled in concrete or rock, as directed by the Contracting Officer. Payment for drilling exploratory holes will be made at the contract price per linear foot for Item 8d, "Drilling 3" (NX) Exploratory Holes."

f. Portland Cement in Grout. - Portland cement will be measured for payment on the basis of the number of cubic feet (94 pounds) of cement used in the grout satisfactorily placed in grout holes and in exploratory holes. Payment for cement will be made at the contract price per cubic foot for Item 8e, "Portland Cement in Grout."

g. Sand in Grout. - Sand in grout will be measured for payment on the basis of the number of cubic feet of sand, dry rodded measurement, used in the grout satisfactorily placed in grout holes or in exploratory holes. Payment for sand will be made at the contract price per cubic foot for Item 8f, "Sand in Grout".

h. Placing Grout. - The operation of placing grout will be measured for payment on the basis of the number of cubic feet of materials, exclusive of water and regardless of the proportions of the mixes, measured individually, as specified in subparagraphs f and g above, satisfactorily placed. Payment for placing grout in grout holes will be made at the contract price per cubic foot for Item 8g, "Placing Grout" which price shall constitute full compensation for proportioning the mix as directed, and mixing and injecting the grout, all as specified herein or as may be directed. Separate payment will be made for all materials used in grout in accordance with the provisions of Paragraphs 7-06f and g.

i. Connections to Grout Holes. - All connections of the grout supply line to grout holes found necessary for the purpose of injecting grout, as determined by the Contracting Officer, will be paid for at the rate of five dollars and no cents (\$5.00) for each connection. Payment for each such connection will be made, regardless of the amount of grout actually injected, at the established contract price per connection for Item 8h, "Connections to Grout Holes."

SECTION 8

ANCHOR BARS
(Item 20)

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SECTION 8

ANCHOR BARS

(Item 20)

8-01. GENERAL. - This section covers furnishing and installing of anchor bars, complete.

8-02. EQUIPMENT. - All equipment shall be of a type, capacity and mechanical condition suitable for doing the work, as determined by the Contracting Officer.

8-03. DRILLING. - The contractor shall drill holes for anchor bars to such depths and in such directions as shown on the drawings or as directed. The minimum diameter of any hole shall be as indicated on the drawings.

8-04. SETTING ANCHORS. - All standing water shall be removed from the holes immediately before grouting and placing anchor bars. Each hole shall be filled with cement grout, with proper proportions or admixture similar and approved equal to "Embeco" as manufactured by the Master Builders of Cleveland, Ohio, and just enough water to produce a plastic mix, and the anchor bar shall be forced to the bottom of the hole while being vibrated by a concrete vibrating machine. Grouting of anchor bars shall be accomplished not less than six (6) days in advance of concrete operations to allow the grout to become properly set. Anchors shall be of types indicated and of sufficient length to extend the required depth into rock. Anchor bars which are found to be loose after the grout has set shall be replaced as directed by the Contracting Officer at the expense of the contractor. Anchors shall conform to the requirements of ASTM Specification A432-62T. Plates shall be of structural steel and shall be welded to bars.

8-05. MEASUREMENT AND PAYMENT. - Measurement will be made by the number of anchor bars set complete in place. Payment will be made at the contract unit price for Item 20 "Anchor Bars", which price shall include full compensation for drilling and grouting of holes, furnishing cement, water and grout, and furnishing and setting of anchor bars of size and type shown on the drawings, to the required depth below the excavated rock surface. No payment will be made for additional length of anchor bars due to rock overbreak and all costs in connection therewith shall be included under the contract unit price for "Anchor Bars."

SECTION 9

CONCRETE
(Items 21 through 25 incl.)

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SECTION 9

CONCRETE

(Items 21 through 25, incl.)

9-01. SCOPE OF WORK. - The work covered by this section consists of furnishing all material and equipment and performing all labor for the manufacture, forming, transporting, placing, finishing, and curing of concrete in the structures included in these specifications.

9-02. COMPOSITION. - a. Concrete. - Concrete shall be composed of portland cement, water, fine and coarse aggregate, and an air-entraining admixture, or

b. Concrete. - Concrete shall be composed of portland blast furnace slag cement, water, fine and coarse aggregate and an air-entraining admixture.

9-03. CEMENT. - a. General. - Cement shall be furnished in bulk except that cement necessary for finishing and patching may be packaged.

b. Portland Cement. - Portland cement shall conform to Federal Specification SS-C-00192f (COM-NBS) Type I or II.

c. Portland-Blast-Furnace Slag Cement. - Portland-blast-furnace slag cement shall conform to Federal Specification SS-C-00197d (COM-NBS), Type IS.

d. Temperature of Cement. - The temperature of the cement as delivered to storage at the site, shall not exceed 150 degrees F.

e. Test Requirements. - Cement will be sampled at the mill or shipping point. All tests will be made by, or under the supervision of, the Government and at its expense. No cement shall be used until notice has been given by the Contracting Officer that the test results are satisfactory. In the event of failure, the cement may be resampled and tested at the contractor's expense. If tests prove that a cement which has been delivered is unsatisfactory, it shall be promptly removed from the site of work. Cement which has been in storage at the project site over four months shall not be used until retest proves it to be satisfactory. When cement is sampled at the mill or shipping point the fill gate or gates of the bin will be sealed and kept sealed until shipment from the bin has been completed. Sealing of the fill gate or gates will be done by or under the supervision of the Government.

f. Transportation of Bulk Cement. - When bulk cement is not unloaded from primary carriers directly into weathertight hoppers at the batching plant, transportation from the railhead, mill, or intermediate

storage to the batching plant shall be accomplished in adequately designed weathertight trucks, conveyors, or other means which will protect the cement completely from exposure to moisture.

g. Storage. - Immediately upon receipt at the site of the work, cement shall be stored in a dry, weathertight and properly ventilated structure. All storage facilities shall be subject to approval and shall be such as to permit easy access for inspection and identification. Sufficient cement shall be in storage to complete any lift of concrete started. In order that cement may not become unduly aged after delivery, the contractor shall use any cement which has been stored at the site for 60 days or more before using cement of lesser age.

h. Source. - The contractor shall notify the Contracting Officer of the source or sources from which the cement will be obtained at least 60 days in advance of the time when concrete placing is expected to begin. If cement is to be obtained from more than one mill, the notification shall state the estimated amount of cement to be obtained from each mill and the proposed schedule of shipments.

9-05. ADMIXTURES. - a. Air-entraining Admixtures. - (1) General. - The air-entraining admixture shall be any approved substance or compound which will produce only entrained air in the concrete as hereinafter specified. The air-entraining admixture shall be added to the batch in solution in a portion of the mixing water. This solution shall be batched by means of a mechanical batcher capable of accurate measurement and in such a manner as will insure uniform distribution of the admixture throughout the batch during the specified mixing period.

(2) Tests. - The contractor shall notify the Contracting Officer in writing of the source from which the admixture will be obtained at least 45 days in advance of the time when concrete placing is expected to begin. The contractor shall provide satisfactory facilities for the ready procurement of adequate test samples. All tests for the evaluation and approval of an admixture will be made by and at the expense of the Government. The suitability of an air-entraining admixture for use will be based on tests prescribed in, and shall meet the requirements of, Corps of Engineers Serial No. CRD-C 13-55 & Revs. 1957-1958. An air-entraining admixture which has been in storage at the project site for longer than 6 months or which has been subjected to freezing shall not be used until retest proves it to be satisfactory.

b. Accelerator. - When approved or directed, the contractor shall use 1 percent of calcium chloride, by weight, of the cement in concrete being placed when the weather is cold enough to require protection of the concrete from freezing. Calcium chloride shall meet the requirements of Federal Specification O-C-105a & Am-1, Type I or Type II. It shall be measured accurately and shall be added to the batch in solution in a portion of the mixing water. The use of calcium chloride in concrete

shall in no way relieve the contractor of responsibility for compliance with the requirements of these specifications governing protection and curing of the concrete.

9-06. AGGREGATES. - a. Composition. - Fine aggregate shall consist of natural sand, manufactured sand, or a combination of natural and manufactured sands. Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, or a combination thereof.

b. Sources and Evaluation Testing. - Aggregates shall be produced from the approved sources listed in Paragraph SC-56 or from another source when approved in accordance with Paragraph SC-56 and the Technical Provisions herein. If the contractor proposes to furnish aggregates from a source not previously approved, the Government will make such tests and other investigations as necessary to determine whether or not aggregates meeting the requirements of these specifications can be produced from the proposed sources. The tests to which the aggregate will be subjected will include specific gravity, absorption, Los Angeles abrasion, soundness in magnesium sulfate, petrographic analyses, freezing and thawing in concrete, alkali-aggregate reaction, organic impurities, and any other tests that are necessary to demonstrate that concrete of acceptable quality can be produced from the materials proposed. These tests will be conducted in accordance with the applicable Corps of Engineers methods of test given in the Handbook for Concrete and Cement. When the contractor desires to use aggregates from a source not previously approved, suitable samples for quality evaluation shall be taken under the supervision of the Contracting Officer in accordance with Corps of Engineers Serial No. CRD-C 100-55 and Revs. of 1958, 1960 and 1963 and shall be delivered in 80-pound lots packed in clean canvas bags to 424 Trapelo Road, Waltham, Massachusetts 02154, within 15 days after date of notice to proceed. Approximately 1,500 pounds of each size shall be required. Sampling and shipping of samples shall be at the contractor's expense.

c. Samples for Mix Designs. - Samples of the aggregates, representative of the materials approved for use in the work, shall be taken under the supervision of the Contracting Officer in accordance with the Corps of Engineers Serial No. CRD-C 100-55 and Revs. of 1958, 1960 and 1963 and delivered in 80 pound lots in clean canvas bags securely tied and identified to 424 Trapelo Road, Waltham, Mass., by the contractor at his expense at least 90 days in advance of the time when the placing of concrete is expected to begin. Mix design studies and tests will be made by the Government and at its expense. Approximately 3,500 pounds of each size aggregate, 15 bags of cement and 1 quart of air-entraining agent shall be required for each mix design. The cement or cements and air-entraining agent shall be those selected for the project.

d. Production Sampling and Testing. - During construction, aggregates will be sampled as delivered to the mixer to determine compliance with specification provision. The contractor shall provide

facilities and labor as may be necessary for the ready procurement of representative test samples. Samples will be obtained when directed by the Contracting Officer and under his supervision. The Government will test such samples at its expense using appropriate Corps of Engineers and ASTM test methods. Tests of aggregates at various stages in the processing and handling operations will be made at the discretion of the Contracting Officer.

e. Quality. - Aggregates, as delivered to the mixer, shall consist of clean, hard, and uncoated particles. Where required, fines shall be removed from the coarse aggregates by adequate washing. The aggregates shall conform to the following specific requirements:

(1) Grading. - (a) Fine Aggregate. - The grading and uniformity of the fine aggregate shall conform to the following requirements as delivered to the mixers:

| <u>Sieve Designation, U.S. Standard Square Mesh</u> | <u>Percentage by Weight Passing</u> |
|---|---|
| No. 4 | 95-100 |
| No. 8 | 80-90 |
| No. 16 | 55-75 |
| No. 30 | 30-60 |
| No. 50 | 12-30 |
| No. 100 | 2-10 |

In addition to the grading limits shown above, the fine aggregate, as delivered to the mixer, shall have a fineness modulus of not less than 2.40 nor more than 3.10. The grading of the fine aggregate shall also be controlled so that the fineness moduli of at least four of any five consecutive test samples of the fine aggregate as delivered to the mixer shall not vary more than 0.15 from the average fineness modulus of all samples taken during the first month's operation unless otherwise directed. The fineness modulus shall be determined by dividing by 100, the sum of the cumulative percentages retained on U.S. Standard Sieves Nos. 4, 8, 16, 30, 50 and 100. At the option of the contractor, fine aggregate may be separated into two or more sizes or classifications, but the uniformity of grading of the separate sizes shall be controlled so that they may be combined throughout the job in fixed proportions established during the first month of operation.

(b) Coarse Aggregate. - The grading of the coarse aggregate within the separated size groups shall conform to the following requirements. These size groups may be obtained by blending additional individual sizes to comply with the required gradations.

| Sieve Size U. S. Standard Square Mesh | Percent by Weight Passing Individual Sieves | |
|---|---|-------------------------|
| | No. 4 to 3/4 In. | 3/4 In. to 1-1/2 In. |
| 2 in. | | 100 |
| 1-1/2 in. | | 90-100 |
| 1 in. | 100 | 20-45 |
| 3/4 in. | 90-100 | 0-10 |
| 1/2 in. | 55-75 | - |
| 3/8 in. | 30-55 | 0-5 |
| No. 4 | 0-5 | - |

(2) Particle Shape. - The shape of the particles in the fine aggregate and in the coarse aggregate shall be generally spherical or cubical. The quantity of flat and elongated particles in the separated size groups of coarse aggregate, as defined and determined by Corps of Engineers Serial No. CRD-C 119-53, shall not exceed 25 percent in any size group.

f. Storage. - Aggregates shall be stored adjacent to the batch plant in such manner as to prevent the inclusion of foreign materials in the concrete. Sufficient aggregate shall be maintained at the site at all times to permit continuous placement and completion of any lift of concrete started.

g. Moisture Control. - All fine aggregate and the smallest size group of the coarse aggregate shall remain in free-draining storage at the site until a stable moisture content is obtained prior to use.

9-07. WATER. - Water for washing aggregates and for mixing and curing concrete shall be fresh and free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances as determined by Corps of Engineers Serial No. CRD-C 400-63.

9-08. PROPORTIONING OF CONCRETE. - a. General. - The proportions of all material entering into the concrete shall be as directed. The proportions will be changed whenever such change is determined necessary to maintain the standard of quality required for the structures covered by these specifications and to meet the varying conditions encountered during construction.

b. Cement Content. - The cement content of the concrete for the various parts of the structure will range from an approximate minimum of 5 to an approximate maximum of 7 bags per cubic yard, depending on the size, type and gradation of aggregate used, and on the structural requirements.

c. Aggregate Content. - The amount and maximum size of aggregate to be used in the various parts of the structure shall be as directed. Concrete mixes will be designed using 1-1/2 inch and 3/4-inch maximum sizes and using the maximum amount of coarse aggregate available and placeable in the various parts of the structures.

d. Entrained-air Content. - The total calculated air content shall be between 5 and 7 percent of the volume of the concrete based on measurements made on concrete immediately after discharge from the mixer (CRD-C 41-59 and Rev. 63). The quantity of air within this range shall be as directed and shall be changed whenever such change is determined necessary to meet the varying conditions encountered during construction.

9-09. BATCHING AND MIXING. - a. General. - The contractor shall provide a batching plant and concrete mixing equipment having a capacity of at least 150 cubic yards in eight hours.

b. Batching Plant. - (1) Location. - The batching plant may be located "on-site" or "off-site".

(2) Arrangement. - Separate bins or compartments shall be provided for fine aggregate, for the different sizes of coarse aggregate and for bulk cements when used. The compartments shall be of ample size and so constructed that the materials will be maintained separated under all working conditions. Aggregates may be weighed cumulatively in one weigh batcher on one scale. Bulk cement shall be weighed either on a separate scale or cumulatively with the aggregate in a separate compartment attached to the aggregate weighing hopper. If cement is weighed on the same scale as the aggregates, the cement shall be weighed first and all hoppers shall be empty and the scale shall be in balance before the weighing is begun. Water may be measured by weight or by volume. If measured by weight it shall not be weighed cumulatively with any other ingredient. The plant shall be arranged so as to facilitate the inspection of all operations at all times. Suitable facilities shall be provided for readily obtaining representative samples of aggregate from each of the bins or compartments for test purposes. Delivery of materials from the batching equipment shall be within the following limits of accuracy:

| <u>Material</u> | <u>Percent</u> |
|-----------------|----------------|
| Cement | 2 |
| Water | 2 |
| Aggregate | 3 |
| Admixtures | 3 |

When materials are weighed cumulatively, each limit above applies to the total weight in the batcher after the material corresponding to that limit has been batched.

(3) Water Batcher and Dispenser for Admixture. - Equipment for batching water and the air-entraining admixture shall be provided at the batching plant or included with the paving mixers or truck mixers as required for the type of plant used.

(a) Water Batchers. - A suitable water measuring device shall be provided which will be capable of measuring the mixing water within the specified requirements for each batch. The mechanism for delivering water to the mixers shall be such that leakage will not occur when the valves are closed. The filling and discharge valves for the water batcher shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed.

(b) Dispenser. - A suitable device for measuring and dispensing the air-entraining admixture shall be provided. The device shall be capable of ready adjustment to permit varying the quantity of admixture to be batched. The dispenser of air-entraining admixtures shall be interlocked with the batching and discharging operations of the water so that the batching and discharging of the admixture will be automatic. When use of truck mixers makes this requirement impracticable, the air-entraining admixture dispenser shall be interlocked with the sand batcher.

(4) Scales. - Adequate facilities shall be provided for the accurate measurement and control of each of the materials entering each batch of concrete. The accuracy of the weighing equipment shall conform to the applicable requirements of National Bureau of Standards Handbook 44 for such equipment. The contractor shall provide standard test weights and any other auxiliary equipment required for checking the operating performance of each scale or other measuring device. Periodic tests shall be made in the presence of a Government inspector in such a manner and at such intervals as may be directed. Upon completion of each check test and before further use, the contractor shall make such adjustments, repairs or replacements as may be required to secure satisfactory performance. Each weighing unit shall include a visible springless dial, which shall indicate the scale load at all stages of the weighing operation, or shall include a beam scale with a beam balance indicator which will show the scale in balance at zero load and at any beam setting. The indicator shall have an over and under travel equal to at least 5 percent of the capacity of the beam. The weighing equipment shall be arranged so that the plant operator can conveniently observe all dials or indicators.

c. Concrete Mixers. - Mixers may be stationary drum or turbine mixers, truck mixers, or paving mixers of approved design. The mixers shall have a rated capacity of at least 27 cubic feet of mixed concrete, and shall not be charged in excess of the capacity recommended by the manufacturer. Mixers shall be capable of combining the materials into a uniform mixture and of discharging this mixture without segregation. Each stationary and paving mixer shall be provided with an acceptable device to

lock the discharge mechanism until the required mixing time has elapsed. Truck mixers shall be equipped with accurate revolution counters and water meters (Neptune Type "S" or equivalent). The mixers shall be operated at the drum or blade speed designated by the manufacturer on the name plate. The mixing periods specified herein are predicated on proper control of the speed of rotation of the mixer drum or mixing blades and on proper introduction of the materials into the mixer. The mixing time will be increased when such increase is necessary to secure the required uniformity of the concrete, or when tests of samples of concrete taken from the first, middle and last portions of the mixer discharge exceed any of the following uniformity requirements when tested in accordance with the provisions of CRD-C 55-61. When authorized, the mixing time may be reduced to the minimum time required to meet all the following requirements:

| Test | Maximum Allowable Variation of Any One Test Value from the Average of Three |
|---|---|
| Water content of mortar, by weight | 5.0% |
| Coarse aggregate content of concrete by weight | 5.0% |
| Unit weight of air-free mortar | 0.8% |
| Cement content of dried mortar, by weight | 10.0% |

Excessive overmixing requiring additions of water, will not be permitted. The mixers shall be maintained in satisfactory operating condition, and mixer drums shall be kept free of hardened concrete. Mixer blades shall be replaced when worn down more than 10 percent of their depth. Should any mixer at any time produce unsatisfactory results, its use shall be promptly discontinued until it is repaired. Suitable facilities shall be provided for obtaining representative samples of concrete for uniformity tests. All necessary platforms, tools, and equipment for obtaining samples shall be furnished by the contractor.

(1) Stationary Mixers. - If no uniformity test data are available, the mixing time for each batch after all solid materials are in the mixer, provided that all of the mixing water is introduced before one-fourth of the mixing time has elapsed, shall be one minute for mixers having a capacity of one cubic yard; for mixers of larger capacities, the minimum mixing time shall be increased 15 seconds for each additional one-half cubic yard or fraction thereof of concrete mixed. When a stationary mixer is used for partial mixing of the concrete (shrink mixing) the mixing time in the stationary mixer may be reduced to the minimum necessary to intermingle the ingredients (about 30 seconds).

(2) Truck Mixers. - Truck mixers shall conform to the requirements of Federal Specification SS-C-618a. When a truck mixer is used either for complete mixing (transit-mixed) or to finish the partial mixing done in a stationary mixer, in the absence of uniformity test data, each batch of concrete shall be mixed not less than 70 nor more than 100 revolutions of the drum at the rate of rotation designated by the manufacturer of the equipment as mixing speed and at the capacity designated in Federal Specification SS-C-618a. If the batch is at least 1/2 cubic yard less than the rated capacity, in the absence of uniformity test data, the number of revolutions at mixing speed may be reduced to not less than 50. Any additional mixing shall be done at the speed designated by the manufacturer of the equipment as agitating speed. When necessary for proper control of the concrete, mixing transit mixed concrete will not be permitted until the truck mixer is at the site of the concrete placement.

(3) Paving Mixers. - Paving mixers shall be used at the site of concrete placement, except as otherwise approved in writing by the Contracting Officer. Paving mixers shall be equipped with boom and bottom-dump bucket to handle the concrete from the mixer to the form. The bucket will be of adequate size to handle the complete batch of concrete mixed, and the boom shall be of sufficient length to permit discharge of the concrete into its final position in the boom. The boom may be replaced with an acceptable crane. Paving mixers may be of either single compartment drum or multiple compartment drum type. A sled or box of suitable size shall be attached to the mixer under the bucket so as to catch any spillage of concrete that may occur when the mixer is discharging concrete into the bucket. Multiple compartment drum paving mixers shall be properly synchronized, and the mixing time shall be determined by including the time required to transfer the concrete between compartments of the drum. If no uniformity test data are available, the mixing time for each batch, after all solid materials are in the mixer drum, provided that all the mixing water is introduced before one-fourth of the mixing time has elapsed, shall be one minute for mixers having a capacity of one cubic yard; for mixers of larger capacities, the minimum mixing time shall be increased 15 seconds for each additional 1/2 cubic yard or fraction thereof of concrete mixed. Vehicles used in transporting material from the batching plant to the mixers shall have bodies or compartments of adequate capacity to carry the materials and to deliver each batch, separate and intact, to the mixer. Except as otherwise approved by the Contracting Officer, loose cement shall be transported from the batching plant to the mixers in separate boxes or compartments which shall be equipped with windproof and rainproof covers.

9-10. CONVEYING. - Concrete shall be conveyed from mixer to forms as rapidly as practicable, by methods which will prevent segregation or loss of ingredients. Any wet batch hopper through which the concrete passes shall be conical in shape. There shall be no vertical drop greater than 5 feet except where suitable equipment is provided to prevent segregation and where specifically authorized. Belt conveyors, chutes, or other similar equipment will not be permitted for conveying concrete. Truck mixers or agitators used for transporting central-mixed concrete shall conform to the

applicable requirements of Federal Specification SS-C-618a. Non-agitating equipment for transporting central-mixed concrete may be used when authorized in writing by the Contracting Officer. Methods and equipment for handling and depositing the concrete in the form shall be subject to the approval of the Contracting Officer. Telephonic or other satisfactory means of rapid communication between the mixing plant and the forms in which concrete is being placed shall be provided and made available for use by the inspectors in the mixing plant and forms.

9-11. PLACING. - a. General. - Concrete shall be worked into the corners and angles of the forms and around all reinforcement and embedded items without permitting the material to segregate. Concrete shall be deposited as close as possible to its final position in the forms. Placing the concrete shall, as far as practicable, be done by means of bottom-dump buckets. The design of the buckets shall be such that the ratio of the area of the clear gate opening or gate throat opening is not less than one-third the maximum interior horizontal area. The design of the bucket shall also provide means for positive regulation of the amount and rate of deposit of concrete in each dumping position. The depositing of concrete by any method used shall be regulated so that the concrete may be effectively compacted with a minimum of lateral movement into horizontal layers approximately 1-1/2 feet in thickness. Not more than four cubic yards may be deposited in one pile for compaction. The surfaces of construction joints shall be kept continuously wet for at least twelve hours during the twenty-four hour period prior to placing concrete. Free water shall be removed prior to placement of mortar and additional concrete. All approximately horizontal surfaces shall be covered by a layer of mortar of the composition directed. Concrete shall then be placed immediately upon the fresh mortar. All concrete placing equipment and methods shall be subject to approval. Concrete placement will not be permitted when, in the opinion of the Contracting Officer, weather conditions prevent proper placement and consolidation.

b. Time Interval Between Mixing and Placing. - Concrete mixed in stationary mixers and transported by non-agitating equipment shall be placed within thirty minutes after it has been mixed, unless otherwise authorized. When a truck mixer or agitator is used for transporting concrete, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours after introduction of the cement to the aggregates except that when the temperature of the concrete exceeds 85 degrees F. the time shall be reduced to 45 minutes. The concrete shall be placed within 15 minutes after it has been discharged.

c. Placing Temperature. - Concrete, when deposited in the forms during cold weather, shall have a temperature of not less than 50 degrees F. nor more than 70 degrees F. Heating of the mixing water or aggregates will not be permitted until the temperature of the concrete has decreased to 50 degrees F. The materials shall be free from ice, snow, and frozen lumps before entering the mixer. All methods and equipment shall be subject to approval. When heating is necessary to keep the concrete temperature above 50 degrees F., it shall be regulated so that the concrete temperature does not exceed 70 degrees F. All concrete placed during warm weather shall be delivered to the forms at the coolest temperature which is practicable to produce under current conditions but not above 85 degrees F.

d. Concrete on Earth Foundations. - Earth foundations upon which concrete is to be placed shall be clean, damp, and free from frost, ice, and standing or running water. Prior to placing concrete the earth foundation shall have been satisfactorily compacted in accordance with the provisions of the excavation sections.

e. Concrete on Rock Foundations. - Rock surfaces upon which concrete is to be placed shall be clean, free from oil, standing or running water, ice, mud, drummy rock, coating, debris and loose, semidetached or unsound fragments. Faults or seams shall be cleaned to a satisfactory depth and to firm rock on the sides. Immediately before concrete is placed, all rock surfaces shall be cleaned thoroughly by the use of wet sandblasting. All devices necessary to produce a foundation free of running or standing water shall be installed by the contractor and securely fastened in place so as to prevent their being jarred loose by concrete placement. The devices and methods of installation shall be approved. All rock surfaces shall be kept continuously wet for at least 24 hours immediately prior to placing concrete thereon. All approximately horizontal surfaces shall be covered, immediately before the concrete is placed, with a layer of mortar of the composition directed.

f. Lift in Concrete. - The depth of concrete placed in each lift will be as shown on the drawings or specified herein. All concrete shall be deposited in approximately horizontal layers about 1-1/2 feet in thickness unless otherwise specifically authorized or directed. The placement shall be carried on at such a rate that the formation of cold joints will be prevented. Slabs shall be placed in one lift unless otherwise authorized or directed. In walls, lifts including door and window openings shall terminate at the top and bottom of the openings unless architectural details indicate otherwise, and other lifts shall terminate at such levels as will conform to architectural details.

g. Vibration of Concrete. - Concrete shall be compacted with mechanical vibrating equipment supplemented by handspading and tamping. In no case shall vibrators be used to transport concrete inside the forms. The vibrating equipment shall be of the internal type and shall at all

times be adequate in number of units and power of each unit to properly consolidate all concrete. Form or surface vibrators shall not be used unless specifically approved. Internal vibrators shall maintain a frequency when submerged in the concrete of not less than 6,000 impulses per minute for spuds with diameters greater than 5-inches and 7,000 impulses for smaller spuds. The intensity (amplitude) of vibration shall be sufficient to produce satisfactory consolidation. The duration of vibration shall be limited to that necessary to produce satisfactory consolidation. The manipulation of the concrete adjacent to the surface of a lift in connection with completing lift placement shall be the minimum necessary to produce the required consolidation. Excessive surface working will not be permitted. Coarse gravel protruding from the surface of the lift shall be "walked down" into the mass during the initial vibrating operations.

h. Placing Concrete through Reinforcement. - In placing concrete through reinforcement, care shall be taken that no segregation of the coarse aggregate occurs. On the bottom of beams and slabs, where the congestion of steel near the forms makes placing difficult, a layer of mortar of the composition directed shall be first deposited to cover the surface to a depth of approximately one inch.

i. Placing Concrete in Ogee Crest and Spillway Buckets. - The unformed portion of the ogee crest and spillway bucket which is to be finished shall be carried slightly above grade and struck off to grade by accurately screeding. Screeding may be accomplished by semimechanical devices or by a mechanical screed which consolidates and screeds the surface in one operation. Ribs embedded in the fresh concrete as guides for screeds will not be permitted.

9-12. CONSTRUCTION JOINT TREATMENT. - a. General. - As a lift is completed, the top surface shall be immediately and carefully protected from any condition that will damage the concrete.

b. Cleaning. - Horizontal construction joints on lifts shall be prepared for receiving the next lift by cleaning with wet sandblasting. Approved wet sandblasting equipment shall be provided.

(1) Wet Sandblasting. - Wet sandblasting shall be performed immediately before placing the following lift. The operation shall be continued until all unsatisfactory concrete, and all laitance, coating, stains, debris, and other foreign materials are removed. The surface of the concrete shall then be washed thoroughly to remove all loose material.

(2) Waste Disposal. - The method used in disposing of waste water employed in cutting, washing and rinsing of concrete surfaces shall be such that the waste water does not stain, discolor, or affect exposed surfaces of the structures. Methods of disposal shall be subject to approval.

9-13. EXPANSION, CONTRACTION AND VERTICAL CONSTRUCTION JOINTS. -

a. General. - Joints shall be provided at the locations indicated on the drawings and according to the details shown on Drawing Std. No. 3 inserted at the end of this section, as shown on the contract drawings or as otherwise approved. The methods and materials used shall be subject to approval and the materials shall conform to Federal Specifications wherever applicable. In no case shall any fixed metal, embedded in concrete, be continuous through an expansion or contraction joint.

b. Joint Fillers. - Premoulded expansion joint filler shall conform to Federal Specification HH-F-341a. Fibrous mastic for bituminous mastic joints shall conform to Federal Specification SS-C-153, type I, heavily fibered with asbestos fibers, shall be suitable for use without priming concrete, and shall, unless otherwise shown, be troweled to a minimum thickness of 1/8-inch applied in two equal applications which shall be continuous over the entire surface.

9-14. FINISHING. - a. General. - Immediately after removal of forms, all unsightly ridges or lips shall be removed and undesirable local bulging on the surfaces to be permanently exposed shall be remedied. Excessive rubbing of formed surfaces will not be permitted. Voids and holes left by the removal of tie rods in all permanently exposed surfaces and surfaces to be exposed to water shall be reamed and completely filled with dry-patching mortar (preshrunk) mixed in the proportions directed. The cement used in the mortar shall be a blend of portland cement and white portland cement properly proportioned so that the final color of the cured mortar will be the same as the color of the surrounding concrete. Defective concrete shall be repaired by cutting out the unsatisfactory material and placing new concrete which shall be secured with keys, dovetails or anchors. Concrete for patching shall be drier than the usual mixture and shall be thoroughly tamped into place. All unformed surfaces of concrete shall have a wood float finish, unless a steel trowel finish is specified, without additional mortar and shall be true to elevation as shown on the drawings. Care shall be taken to see that all free water which has accumulated at the surface is removed before making any finish. Other surfaces shall be brought to the specified elevation and left true and regular. Where indicated on the drawings, joints shall be carefully made with a jointing tool. Every precaution shall be taken by the contractor to protect finished surfaces from stains or abrasions. Surfaces or edges likely to be injured during the construction period shall be properly protected.

b. Unformed Surfaces. - The Bubble Gage Shelter floor and the transition section floor shall be given a steel trowel finish. Where wood float finish is indicated or specified, floating shall be started as soon as the screeded surface has stiffened sufficiently to permit floating and shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture. Floating may be performed by use of hand or power-driven equipment. Where a steel-trowel is specified or indicated, troweling shall be performed as soon as the floated surface has hardened sufficiently

to prevent an excess of fine material from being drawn to the surface. Steel troweling shall be performed with firm pressure to produce a dense, uniform surface, free from blemishes and trowel marks. Surfaces shall be sloped for drainage where shown on the drawings or directed. Dusting of fresh concrete with dry cement prior to finishing will not be permitted.

c. Surface Irregularities. - Surface irregularities of either a floated or wood troweled finish shall not exceed 1/4-inch as measured with a 10-foot template and of steel trowel finish shall not exceed 1/8-inch as measured with a 10-foot template.

d. Sack-rubbed Finish. - This type of finish shall be given to exterior exposed-to-view surfaces of Bubble Gage Shelter and adjacent stairs vertical surfaces. As approved by the Contracting Officer and after all required patching, cleaning, and correction of major imperfections have been completed, the concrete surface shall be given a sack-rubbed finish as hereinafter described. The finish for any area shall be completed in the same day and the limits of a finished area shall be made at natural breaks in the finished surface. The sack-rubbed finish shall consist of thoroughly wetting the surface to prevent absorption of water from the mortar and then coating the surface with mortar. The mortar shall be applied as soon as the surface of the concrete approaches surface dryness and shall be vigorously and thoroughly rubbed over the area with clean burlap pads so as to fill all voids. The mortar shall be composed of one part Portland cement to two parts by volume of well-graded sand passing a No. 30 sieve mixed with water to the consistency of thick paint. White cement shall be used for all or part of the cement as approved by the Contracting Officer to give the desired color. The applied coating shall be uniform, completely filling all pits, air bubbles, and surface voids. While the mortar is still plastic, the surface shall be sack-rubbed with a dry mix of the same proportions and materials specified above, except that no water will be used. The burlap pads used for this operation shall be stretched tightly around a board to prevent dishing the mortar in the voids. No material shall remain on the surface except that within the voids. The sack-rubbing with a dry mix shall be performed at a time when the mortar will not be pulled from the voids or depressions. In hot, dry weather the sack-rubbed finish treatment shall be made in shaded areas. If it is absolutely necessary to perform sack-rubbed finishing in areas subject to direct rays of the sun, the concrete surfaces shall be covered with damp burlap, or a continuous fog spray applied, or some other suitable method used to moisten the concrete surface for a minimum of one hour before finishing operations are begun. Immediately after the sack-rubbed treatment is completed, the surface shall be continuously moist cured for 72 hours.

e. Nonslip Finish. - Nonslip finish shall be given to exterior stair treads and roof of the Bubble Gage Structure. The concrete shall be finished by tamping with special tools to force the coarse aggregate away from the surface, then screeding and floating to bring the surface to the required level. The concrete while still plastic, shall be wood floated and brushed in a direction transverse to the traffic with a camel hair broom to produce a surface having a rough texture providing an approved nonslip finish.

9-15. CURING AND PROTECTION. - a. General. - All concrete shall be cured by an approved method or combination of methods for the period of time given below corresponding to the cementing materials used in the concrete:

| | |
|--|---------|
| Type I portland cement | 7 days |
| Type II portland cement or portland-blast-furnace-slag cement | 14 days |

The contractor shall have all equipment needed for adequate curing and protection of the concrete on hand and ready to install before actual concrete placement begins. The curing medium and method, or the combination of mediums and methods used, shall be approved in writing. The curing medium shall be applied so as to prevent loss of moisture from the concrete. Concrete shall be protected from heavy rains for 12 hours, flowing water for 14 days and direct rays of the sun for 3 days. All concrete shall be adequately protected from damage. No fire or excessive heat shall be permitted near or in direct contact with concrete at any time. All conduits and other formed openings through the concrete shall be closed during the entire construction period.

b. Moist Curing. - All concrete herein shall be moist-cured by maintaining all surfaces continuously (not periodically) wet for the duration of the entire curing period with the exceptions listed below. Water for curing shall comply with the requirements of paragraph 9-07. All surfaces of concrete, which are to be permanently exposed, shall be cleaned if a water is used which stains the surfaces: Where forms of tongue-and-groove or shiplap sheathing are used and left in place during curing, the sheathing shall be kept wet at all times. Horizontal construction joints and finished horizontal surfaces cured with sand shall be covered with a uniform thickness of 2 inches of sand which shall be kept continuously saturated. The following exceptions to the requirements for moist curing are permitted:

(1) Horizontal construction joints may be allowed to dry for twelve hours immediately prior to the placing of the following lift;

(2) Concrete for which cold weather protection is provided entirely by insulation may be cured by the following procedure:

All joints in the insulation may be sealed to prevent moisture loss and maintained sealed throughout the curing period.

c. Cold Weather. - The air and forms in contact with concrete sections having a minimum dimension less than 12 inches shall be maintained at temperature above 50 degrees F. for at least the first 3 days and at a temperature above freezing for the remainder of the specified curing period. Concrete in more massive sections shall be maintained at temperatures above 40 degrees F. for at least the first 3 days and at a temperature above freezing for the remainder of the specified curing period. The temperature

protection equipment, the curing water and the removal of forms shall be handled in such a manner that the surface concrete will not be subjected to a temperature differential of more than 25 degrees F. as determined by observation of ambient and concrete surface temperatures indicated by suitable thermometers, furnished by the contractor and installed outside of the concrete and 2 inches inside the surface of the concrete. The installation of the thermometers shall be made by the contractor at such locations as may be directed.

9-16. FORMS AND FORMED SURFACES. - a. General. - Forms shall be true to line and grade, mortar-tight and sufficiently rigid to prevent objectionable deformation under load. That portion of the form in contact with the concrete shall not be of a material which interferes with the setting of the concrete. Where forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface so as to obtain accurate alignment of the surface and to prevent leakage of mortar. Responsibility for their adequacy shall rest with the contractor; however, the type, shape, size, quality, and strength of all materials of which the forms are made shall be subject to specific approval. Bolts and rods used for internal ties shall be so arranged, that when the forms are removed, metal will be not less than 2 inches from any concrete surface. Wire ties will not be permitted where the concrete surface will be exposed to weathering and where discoloration will be objectionable. All forms shall be so constructed that they can be removed without damaging the concrete. All exposed joints, edges, and external corners shall be chamfered and dummy chamfers and false joints shall be used to provide a neat and uniform appearance, unless otherwise directed or indicated on the drawings.

b. Surface Finish Requirements. - The class of finish required for the various surfaces of the structures shall be as hereinafter specified or directed on drawings. Allowable irregularities are designated "abrupt" and "gradual" for purposes of providing tolerances. Offsets resulting from displaced, misplaced or mismatched forms, or sheathing, or by loose knots in sheathing, or other similar form defects, shall be considered "abrupt" irregularities. Irregularities resulting from warping, unplaneness and similar uniform variations from planeness, or true curvature, shall be considered "gradual" irregularities. "Gradual" irregularities will be checked for conformance with the prescribed tolerances by means of 5-foot templates composed of a straight edge for plane surfaces, or a "shaped" template for curved or warped surfaces. The requirements for the classes of finish specified on the drawings and for the types of form materials permitted for each class shall be as specified below:

(1) Class "A" Finish. - Class "A" finish shall be given to exterior of Bubble Gage Shelter and adjacent stair vertical surfaces and to stop log slots. Where Class "A" finish is specified, the sheathing shall be composed of well-matched tight-fitting tongue and groove lumber or plywood or concrete form board. If necessary, the sheathing shall be sanded to remove imperfections and to provide a form surface which will produce a concrete surface meeting the following tolerances: "Abrupt" irregularities shall not exceed 1/8-inch. "Gradual" irregularities shall not exceed 1/4-inch in 5 feet, determined in the specific manner.

(2) Class "B" Finish. - Class "B" finish shall be given to all concrete surfaces except where Class "A" or Class "D" is specified. Where Class "B" finish is specified, the sheathing may be composed of tongue and groove lumber, shiplap, plywood, concrete form board, or steel. Steel lining on wood sheathing will not be permitted. The sheathing shall provide a surface which will produce a concrete surface meeting the following tolerances: "Abrupt" irregularities shall not exceed 1/4-inch and "gradual" irregularities shall not exceed 1/2-inch in 5 feet determined in the specified manner.

(3) Class "D" Finish. - Class "D" finish shall be given to all surfaces against which backfill or concrete is to be placed. Where Class "D" finish is specified, the sheathing may be of wood, or steel, or may be steel lined. "Gradual" and/or "abrupt" irregularities shall not exceed 1 inch.

c. Construction Tolerances. - Variation in alignment, grade and dimensions of the structures from the established alignment, grade and dimensions shown on the drawings shall be within the tolerances specified in the following tables:

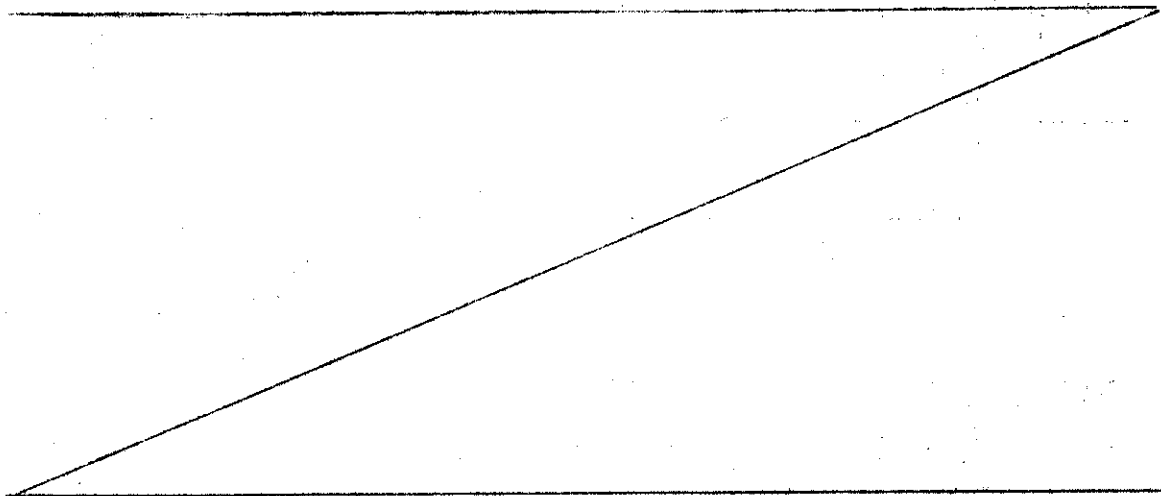


TABLE I

CONSTRUCTION TOLERANCES FOR REINFORCED CONCRETE CONSTRUCTION

| | | | |
|-----|---|---|----------------------------------|
| (1) | Variation from the plumb: | In 10 feet | 1/4 inch |
| | a. In the lines and surfaces of columns, piers, walls and in arrises | In any story or 20 feet maximum . . | 3/8 inch |
| | | In 40 feet or more . . | 3/4 inch |
| | b. For exposed corner columns, control-joint grooves, and other conspicuous lines | In any bay or 20 feet maximum . . | 1/4 inch |
| | | In 40 feet or more . . | 1/2 inch |
| (2) | Variation from the level or from the grades indicated on the drawings: | In 10 feet | 1/4 inch |
| | a. In floors, ceilings, beam soffits, and in arrises | In any bay or 20 feet maximum . . | 3/8 inch |
| | | In 40 feet or more . . | 3/4 inch |
| | b. For exposed lintels, sills, and other conspicuous lines | In any bay or 20 feet maximum . . | 1/4 inch |
| | | In 40 feet or more . . | 1/2 inch |
| (3) | Variation of the linear building lines from established position in plan and related position of columns, walls, and partitions | In any bay or 20 feet maximum . . | 1/2 inch |
| | | In 40 feet or more . . | 1 inch |
| (4) | Variation in the sizes and locations of sleeves, floor openings, and wall openings | | 1/4 inch |
| (5) | Variation in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls | Minus | 1/4 inch |
| | | Plus | 1/2 inch |
| (6) | Footings: | Minus | 1/2 inch |
| | a. Variation of dimensions in plan | Plus | 2 inches |
| | b. Misplacement or eccentricity | 2 percent of the footing width in the direction of misplacement but not more than . . | 2 inches |
| | c. Reduction in thickness | Minus | 5 percent of specified thickness |
| (7) | Variation in steps: | Rise | 1/8 inch |
| | a. In a flight of stairs | Tread | 1/4 inch |
| | b. In consecutive steps | Rise | 1/16 inch |
| | | Tread | 1/8 inch |

TABLE II

CONSTRUCTION TOLERANCES FOR MASS CONCRETE STRUCTURES

| | |
|--|--|
| (1) All structures: | |
| a. Variation of the constructed linear outline from established position in plan | In 20 feet 1/2 inch In 40 feet 3/4 inch |
| b. Variations of dimensions to individual structure features from established positions | In 80 feet or more . . 1-1/4 inch In buried construction, twice the above amounts |
| (2) a. Variation from the plumb, from the specified batter, or from the curved surfaces of all structures, including the lines and surfaces of columns, walls, piers, buttresses, arch sections, vertical joint grooves, and visible arrises | |
| | In 10 feet 1/2 inch In 20 feet 3/4 inch In 40 feet or more . . 1-1/4 inches In buried construction, twice the above amounts |
| b. Variation from the level or from the grades indicated on the drawings in slabs, beams, soffits, horizontal joint grooves, and visible arrises | 10 feet 1/4 inch In 30 feet or more . . 1/2 inch In buried construction, twice the above amounts |
| (3) a. Variation in cross sectional dimensions of columns, beams, buttresses, piers, and similar members | |
| | Minus 1/4 inch Plus 1/2 inch |
| b. Variation in the thickness of slabs, walls, arch sections, and similar members | Minus 1/4 inch Plus 1/2 inch |
| (4) Footings for columns, piers, walls, buttresses, and similar members: | |
| a. Variation of dimension in plan | Minus 1/2 inch Plus 2 inches |
| b. Misplacement or eccentricity | 2 percent of footing width in the direction of misplacement but not more than . . . 2 inches |
| c. Reduction in thickness | 5 percent of specified thickness |

d. Coating. - An approved colorless mineral oil, not darker than ASTM No. 3 in accordance with ASTM Standard D-1500, free of kerosene, with a viscosity of not less than 70 seconds nor more than 110 seconds (Saybolt Universal) at 100 degrees F., except that when used on hardboard forms, the viscosity shall be not less than 250 seconds at 100 degrees F. Flash point shall be not less than 300 degrees F. (open cup). Viscosity and flash point shall be determined in accordance with ASTM Standards D 88 and D 92, respectively. Certified copies of results of laboratory tests performed by an approved commercial laboratory shall be submitted for approval. After oiling, surplus oil on the form surfaces and any oil on the reinforcing steel or other surfaces requiring bond with the concrete shall be removed. Forms for unexposed surfaces may be thoroughly wetted in lieu of oiling immediately before the placing of concrete, except that in freezing weather oil shall be used.

e. Removal. - Forms shall not be removed without approval, and all removal shall be accomplished in a manner which will prevent injury to the concrete. Forms shall not be removed before the expiration of the minimum time indicated below, except as otherwise directed or specifically authorized.

| | |
|--------------------------------|--------|
| Conduit roofs | 144 hr |
| Beams and deck-type slabs | 144 hr |
| Walls (lifts 15 ft. and under) | 24 hr |
| Walls (lifts over 15 ft.) | 48 hr |
| Mass concrete (face) | 36 hr |
| Mass concrete (bulkhead) | 48 hr |
| Conduit in open cut | 72 hr |

When conditions on the work are such as to justify the requirement, forms will be required to remain in place for longer periods.

9-17. FURNISHING AND PLACING STEEL REINFORCEMENT. - a. General. - The contractor shall furnish, cut, bend, and place all steel reinforcement including rods, fabric, and structural shapes as indicated on the drawings or otherwise required. All reinforcement shall be, when surrounding concrete is placed, free from loose, flaky rust, and scale, and free from oil, grease or other coating which might destroy or reduce its bond with the concrete. The contractor shall submit for approval shop drawings, bar lists and bending diagrams. Contract drawings show the basic steel requirements and are not necessarily complete as to layout of reinforcing steel. The contractor shall furnish complete steel placement shop drawings elaborating wherever necessary over what is shown on the contract drawings.

b. Cutting and Bending. - Steel reinforcement may be mill or field bent. All bending shall be in accordance with standard approved practice and by approved machine methods.

c. Reinforcement. - (1) Reinforcing steel for concrete shall conform to the requirements of ASTM Specification A15-62T, intermediate billet, deformed. Rail steel, ASTM Specification A16-62T, regular grade, deformed, or hardgrade billet steel, ASTM Specification A15-62T deformed, may be furnished for straight bars or shop bends only. Certified copies of all mill reports shall accompany all deliveries of reinforcing steel.

(2) Mesh reinforcement shall conform to the requirements of ASTM Specification A185-61T, and unless otherwise indicated on the drawings, shall be 6-inch mesh of No. 6 gage wire.

d. Spacing of Bars. - The spacing of bars shall be as shown on the contract drawings or as directed, and shall conform to the tolerances shown in Table III.

e. Relation of Bars to Concrete Surfaces. - The minimum cover for all main reinforcement shall conform to the dimensions shown on the drawings within the tolerances shown in Table III. The dimensions, as shown on the drawings, indicate the clear distance from the edge of the main reinforcement to the concrete surface. The concrete covering of stirrups, spacer bars, and similar secondary reinforcement may be reduced by the diameter of such bars.

TABLE III

CONSTRUCTION TOLERANCE FOR PLACING REINFORCING STEEL

| | | |
|--------------------------------------|----------------------------------|----------|
| (1) Variation of protective covering | With 2-inch cover. | 1/4 inch |
| | With 3-inch cover and over . . . | 1/2 inch |
| (2) Variation from indicated spacing | | 1 inch |

f. Splicing. - All splices in reinforcement shall be as shown on the drawings. Lapped ends of bars may be placed in contact and securely wired or may be separated sufficiently to permit the embedment of the entire surface of each bar in concrete. Adjacent sheets of mesh reinforcement shall be spliced by lapping not less than 6 inches, the lapped ends being securely wired or clipped together with standard clips.

g. Supports. - All reinforcement shall be secured in place by use of metal or concrete supports, spacers, or ties, as approved. Such supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operation. The supports shall be used in such manner that they will not be exposed or contribute in any way to the discoloration or deterioration of the concrete.

9-18. EMBEDDED ITEMS. - a. Before placing concrete, care shall be taken to determine that all embedded items are firmly and securely fastened

in place as indicated on the drawings, or required. Embedded items including pipe and conduit, shall be free of oil and other foreign matter such as loose coatings of rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed.

b. Pipe Drains. - Asbestos cement pipe required for pipe drains and not required to be furnished under Section 7, shall be furnished, cut and embedded by the contractor under this section. The pipe shall conform to Federal Specification SS-P-351a, "Pipe Cement Asbestos", Class 150. Pipe will be of the diameter and in the locations indicated on the drawings. The pipe shall be cleaned thoroughly of all dirt, grease, oil, grout and mortar immediately before embedment, and shall be held firmly in position and protected from damage or displacement while the concrete is being placed. The contractor shall take all necessary precautions to prevent any pipe from becoming clogged or obstructed from any cause, and any pipe which becomes clogged shall be cleaned out in a manner satisfactory to the Contracting Officer at the contractor's expense.

9-19. MEASUREMENT AND PAYMENT. - a. Concrete. - Measurement of concrete will be made on the basis of the actual volume of concrete within the lines and grades of the structures as indicated on the drawings. Measurement of concrete placed against the sides of any excavation without the use of intervening forms will be made only within the indicated limits of the structure. No deductions will be made for rounded or beveled edges or space occupied by metal work, electrical conduits or timber, nor for voids or embedded items which are either less than 5 cubic feet in volume or one square foot in cross section. Unless otherwise specified, payment for concrete will be made at the respective contract prices per cubic yard for the various items of the schedule, which price shall include the cost of all labor, materials, and the use of all equipment and tools required to complete the concrete work; except the cement, reinforcement, and embedded parts which are specified to be paid for separately. No payment will be made for concrete, as such, which is placed in structures or in items for which payment is made as described in Subparagraph d, below. No payment will be made for expansion and contraction joint material, joint sealing materials, and pipe drains, and all costs in connection therewith shall be included in the applicable contract prices. No separate payment will be made for mortar and grout for miscellaneous purposes (except as provided under Item 23A) and all costs in connection therewith shall be included in the contract unit and lump sum prices for the items of work to which the work is incidental. Bidding schedule items for concrete under this contract are as follows:

(1) Concrete-Outlet Works-Inlet and Outlet. - This item includes all concrete placed in the outlet works except the conduit between Sta 3+93 to Sta. 7+77, but including wall at outlet end. Payment therefor will be made at the contract unit price per cubic yard for Item 21, "Concrete-Outlet Works-Inlet and Outlet".

(2) Concrete-Outlet Works-Conduit. - This item includes all concrete placed in the Outlet Works conduit from Sta. 3+93 to Sta. 7+77, except this item does not include the concrete wall at the outlet end. Payment therefor will be made at the contract unit price per cubic yard for Item 22, "Concrete-Outlet Works-Conduit Sta. 3+93 to Sta. 7+77".

(3) Concrete-Spillway-Weir and Walls. - This item includes all concrete placed in the spillway including walls and the weir. Payment therefor will be made at the contract unit price per cubic yard for Item 23, "Concrete-Spillway-Weir and Walls".

(4) Item 23A, "Concrete for Foundation Preparation". - See Section 5.

b. Portland Cement. - The quantity to be paid for under Item 24, "Portland Cement" will be the number of barrels (376 pounds net weight) of portland cement or portland blast furnace slag cement used unless specifically excepted, wasted or used for the convenience of the contractor. The quantity to be paid for will be determined by multiplying the theoretical batch weight of portland cement in each type of concrete used by the number of batches of concrete of the types placed within the pay lines of the structure, and dividing by 376. Payment shall be made at the contract price per barrel for the schedule item which price shall include the cost of required unloading, hauling, handling, and storage at the site, of all portland cement used in the work. No payment will be made for cement included under other items of work.

c. Reinforcement. - (1) Bars. - Measurement of reinforcing bars will be made on the basis of the lengths of bars placed in accordance with the approved drawings or bar schedules or as directed. The measured lengths will be converted to weights for the size of bars listed by the use of the unit weights per lineal foot stated on the applicable ASTM Specification. Steel in laps indicated on the drawings or required by the Contracting Officer will be paid for at the contract unit price. No payment will be made for the additional steel in laps which are authorized for the convenience of the contractor. Except as noted below, furnishing and placing reinforcement bars will be paid for at the contract unit price per pound for Item 25, "Steel, Reinforcement".

(2) No separate payment will be made for wire mesh reinforcement and all costs will be included in applicable contract price.

d. Other Items. - (1) Payment for concrete, cement, and reinforcing steel used in the following items, will be included under the applicable payment item for these items and no separate payment will be made therefor.

Description

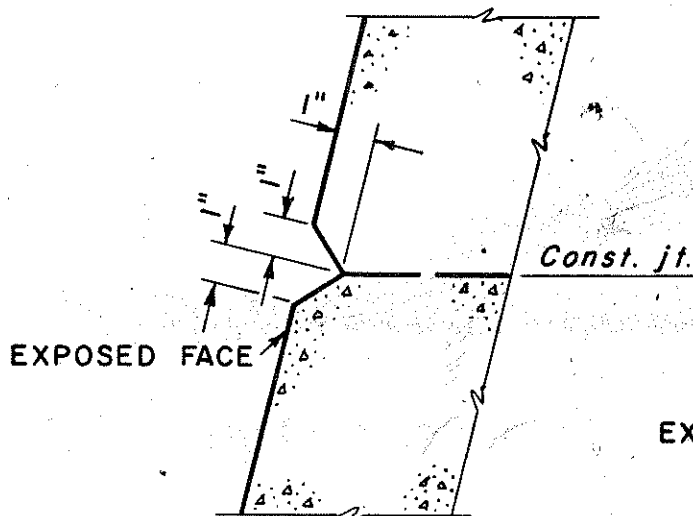
Cable Guard Rail and Posts
Chain Link Fencing and Gates
Bubble Gage Shelter Structure and Stairs
Concrete Pipe and Conduit
Storm Drainage Items

(2) Payment for cement used in the following items will be included under the applicable payment items, and no separate payment will be made.

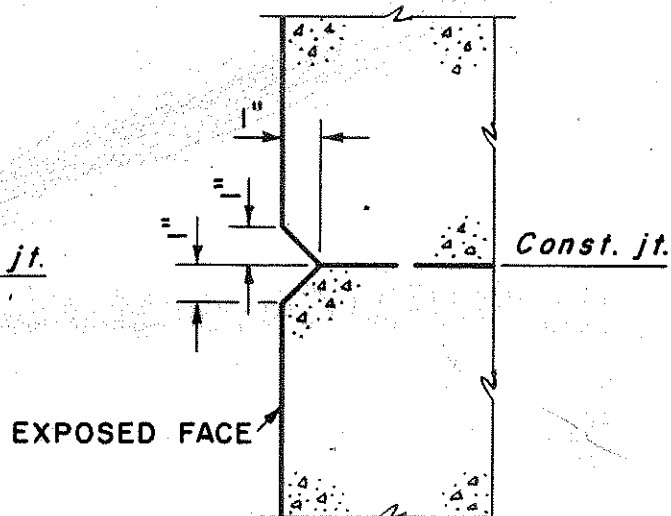
Description

Mortar for Foundation Preparation
Mortar for Masonry Work
Grout for Anchor Bars

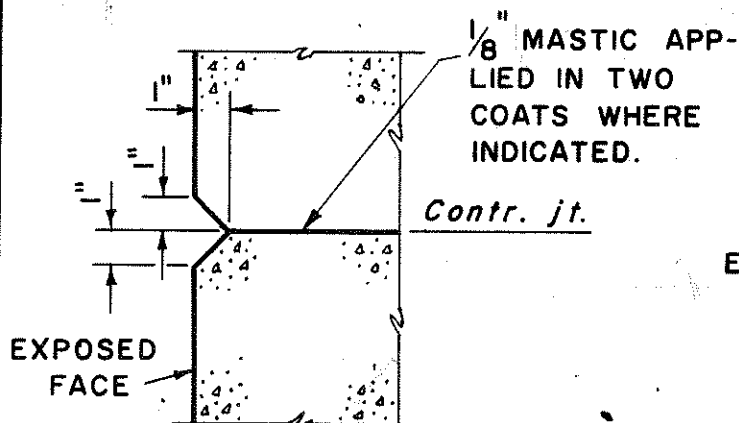
(3) Payment for cement used in grout under "Drilling and Grouting" will be made under Item 8e, "Portland Cement in Grout".



CONSTRUCTION JOINT
SLOPING FACE
(Const. jt.)

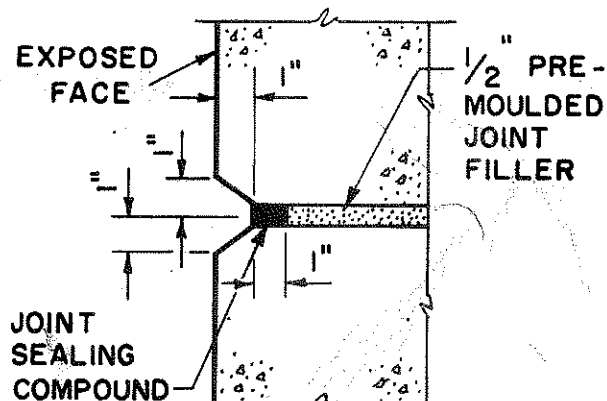


CONSTRUCTION JOINT
VERTICAL
(Const. jt.)

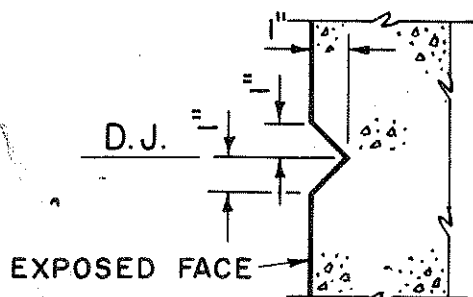


CONTRACTION JOINT (Contr. jt.)

HORIZONTAL CONSTRUCTION JOINTS SHALL BE FLUSH TYPE EXCEPT THAT GRAVITY WALLS SHALL BE "V" GROOVED AS SHOWN ABOVE.



EXPANSION JOINT (Exp. jt.)
(FOR FLOOD WALLS)



DUMMY JOINT (D.J.)

NOTE:

REINFORCING STEEL SHALL PASS THRU CONSTRUCTION JOINTS BUT NOT THRU CONTRACTION JOINTS.

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

**STANDARD STRUCTURAL
JOINT DETAILS**

(NOT TO SCALE)

DWG. NO. STD-3 DATE: FEB. 1964

SECTION 10
CONCRETE PIPE CONDUIT
(Item 26)

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SECTION 10

CONCRETE PIPE CONDUIT (Item 26)

10-01. SCOPE. - This section covers construction of the 3' - 0" diameter concrete pipe conduit, complete, including pipe supports.

10-02. APPLICABLE PUBLICATIONS. - The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

a. Federal Specification. -

SS-C-00192f Cement, Portland.
(COM-NBS)

b. American Society for Testing and Materials Standards. -

| | |
|-----------|--|
| A-15-62T | Billet-Steel Bars for Concrete Reinforcement. |
| A-31-55 | Boiler Rivet Steel and Rivets. |
| A-185-61T | Welded Steel Wire Fabric for Concrete Reinforcement. |
| A-283-58 | Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality (Plates 2 in. and under in thickness). |
| A-432-62T | Deformed Billet Steel Bars for Concrete Reinforcement with 60,000 p.s.i. Minimum Yield Point. |
| C-33-63 | Concrete Aggregate. |
| C-76-63T | Reinforced Concrete Culvert, Storm Drain and Sewer Pipe. |
| C-231-62 | Air Content of Freshly Mixed Concrete by the Pressure Methods. |
| C-443-63 | Joints for Circular Concrete Sewer and Culvert Pipe, Using Flexible Watertight, Rubber-Type Gaskets. |

c. U. S. Army Corps of Engineers Handbook for Cement and Concrete. -

CRD-C13-55 Air-Entraining Admixtures for Concrete.
& Revs. 1957
- 1958

10-03. GENERAL. - Concrete pipe shall conform to the applicable requirements of ASTM Standard C 76, except as modified hereinafter. The pipe

joint shall be sealed by a rubber gasket. Each length of pipe shall be provided with bell and spigot ends formed by steel joint rings securely fastened in the pipe wall. The spigot ring shall be lined with concrete on its interior surface and the bell ring shall be covered with concrete on its exterior surface. Portions of the joint rings which will be exposed after the pipe is manufactured shall be protected from corrosion by a metallic coating or equivalent applied by an approved method. The spigot ring shall have a groove for the purpose of receiving, holding and protecting the gasket. The steel for bell rings shall be 1/4 inch or more in thickness and shall conform to Grade A or B, ASTM Specification A-283. The steel for the spigot ends shall conform to Grade A, ASTM Specification A-31. The joint shall conform in all essential details with the rubber and steel joint for concrete pressure pipe as manufactured by Lock Joint Pipe Company. The pipe shall be cast vertically.

a. Strength Requirements. - (1) Compressive strength of concrete shall be not less than 5,000 p.s.i. at 28 days of age.

(2) Design load for pipe shall be as shown on the drawings. Not more than three lengths of pipe, selected at random shall be tested by the three edge bearing method to determine the load to produce a 0.01 inch crack and for ultimate strength. The test load required to produce a 0.01 crack using a load factor of 3.0 shall be based on a factor of safety of not less than 1.33. The test load required to produce failure shall be based on a factor of safety of not less than 2.0 using a load factor of 3.0. The contractor shall furnish the extra lengths of pipe for testing without charge. Test methods shall conform to the applicable requirements of ASTM Specification C-76.

b. Responsibility and Certification. - All tests performed on the pipe shall be observed by a representative of the Contracting Officer. The Government reserves the right to observe and inspect all phases of the manufacture and testing of the pipe. The contractor shall be responsible for having the materials, the concrete and pipe he proposes to furnish tested to demonstrate conformance to the applicable specifications. Certified copies of the test reports shall be delivered to the Contracting Officer, before the pipe is installed.

10-04. MATERIALS. - The following materials shall conform to the respective specifications and the requirements specified below.

a. Concrete. - Concrete shall be composed of Portland cement, fine and coarse aggregate, water and air-entraining admixture.

(1) Portland cement shall conform to Federal Specification SS-C-192, type II.

(2) Processed Aggregates. - Aggregates shall conform to ASTM Standard C33, except the grading requirements shall not apply.

(3) Air-entraining admixture. - The air-entraining admixture shall be any approved substance or compound which will produce entrained air in the concrete. The air-entraining admixture shall conform to Corps of Engineers Serial No. CRD-C13, and will be accepted on manufacturer's certification of compliance. The air content by volume shall be 6.0 percent plus or minus 1.0 percent as determined by ASTM Standard C231.

(4) Water. - Water used in mixing and curing concrete shall be fresh, clean, and suitable for use as drinking water.

b. Reinforcement. - Reinforcement steel shall conform to ASTM Standard A432, deformed, or ASTM Standard A15, hard grade, deformed. Welded wire fabric conforming to ASTM 185 will be acceptable. Reinforcing steel will be accepted on the basis of certified mill reports.

c. Rubber Gasket. - The gasket sealing the joint shall be made of rubber of special composition, having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five years experience in the manufacture of rubber gaskets for pipe joints. The gasket shall be in a continuous ring, of suitable cross section and of such size as to fill the groove on the spigot joint ring when the pipes are laid. The rubber gasket shall be the sole element depended upon to make the joint watertight and shall have smooth surfaces free from pitting, blisters, porosity and other imperfections.

10-05. INSTALLATION. - a. General. - The pipe shall be supported on chairs or other suitable means to substantially and uniformly support the pipe at the correct line and grade during placement of concrete. The pipe shall be anchored to prevent movement during placement of concrete. All pipe laying shall proceed from the intake transition with the tongue ends of tongue and groove pipe pointing upstream. Each pipe shall be laid true to line and grade and in such manner as to form a close joint with the adjoining pipe. As the work progresses, the interior of the pipe shall be cleared of all dirt, and superfluous material of every description. At times when work is not in progress, open ends of pipe and fittings shall be securely and satisfactorily closed so that no water, earth or other substance will enter the pipe or fittings.

b. Jointing. - The pipe shall be jointed in accordance with the manufacturer's recommendations. In making the joints on the interior of the pipe, special care shall be taken to assure a smooth surface with no projections or depressions.

c. Concrete. - After pipe has been installed, inspected and approved by the Contracting Officer, concrete shall be placed and compacted with vibration equipment to the indicated limits as specified under Section 9, CONCRETE.

10-06. PAYMENT. - Payment for all work specified in this section, except as specified below, will be made at the lump sum price for Item 26, "Pipe Conduit". Concrete and cement in connection with the concrete placed under or around the pipe will be paid for separately under the applicable payment items.

SECTION 11

EXCAVATION, TRENCHING, AND BACKFILLING FOR CULVERTS AND DRAINS (INDEX)

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SECTION 11

EXCAVATION, TRENCHING, AND BACKFILLING FOR CULVERTS AND DRAINS

11-01. SCOPE. - The work covered in this section of the specifications consists of furnishing all plant, labor, material, equipment, and appliances, and of performing all operations in connection with excavation, trenching, and backfilling for all culverts and drains and appurtenant structures, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

11-02. EXCAVATION. - a. General. - (1) Excavation for Large Culverts.- Excavations for the 17-foot diameter culvert at the Vinica Brook crossing, the 15-foot diameter culvert at the Conant Brook crossing, and the 54-inch diameter culvert in the vicinity of Station 62+50 on the Wales Road relocation shall be to the lines and grades indicated on the drawings or as directed by the Contracting Officer. All provisions of Section 3, "EXCAVATION" of these specifications shall be applicable to the excavations for these three large culverts.

(2) Excavations for other Culverts and Drains. - For all culverts and drains, except those covered in Subparagraph 11-02a (1) above, all excavation of every description and of whatever substances encountered shall be performed to the depths indicated or as otherwise specified. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excess material or material unsuitable for backfill, shall be removed and placed in spoil areas, embankments, and fills as directed. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved methods. Sheet piling and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel. Excavation shall be by open cut. Earth excavation shall comprise all materials not classified as rock excavation, and shall include clay, silt, sand, gravel, loose shale, loose stone, and boulders measuring less than 1/2 cubic yard in volume. Rock excavation shall comprise the following: boulders measuring 1/2 cubic yard or more in volume; rock material in ledges, bedded deposits, unstratified masses, and conglomerate deposits so firmly cemented as to possess the characteristics of solid rock that cannot be removed without systematic drilling and blasting; and concrete or masonry structures.

b. Trench Excavations. - Trenches for the pipes, other than the three large culverts described in Subparagraph 11-02a. (1) above, shall be of the necessary width for the proper laying of the pipe and placement and

compaction of backfill. Trench widths shall be sufficient to leave at least 24 inches in the clear between the sides of the pipe and the sides of the trench. The banks of the trenches shall be as nearly vertical as practicable. Care shall be taken not to over-excavate except as otherwise specified, hereinafter. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for the portions of the pipe sections where it is necessary to excavate for the proper sealing of pipe joints and as hereinafter specified. Depressions for joints shall be dug after the trench bottom has been graded, and, in order that the pipe rest on the prepared bottom for as nearly its full length as practicable, the depressions shall be only of such length, depth, and width as required for properly making the particular type of joint. Stones shall be removed as necessary to avoid point bearing. Where rock excavation, as defined hereinbefore, is required in trenches for pipe, the rock shall be excavated to a minimum overdepth of 8 inches below the trench depths indicated or specified and the overdepth filled with compacted pipe bedding material. Except as hereinafter specified for wet or otherwise unstable material, all other overdepths shall be backfilled as and with materials specified for backfilling the lower portion of trenches. Whenever wet or otherwise unstable material that is incapable of properly supporting the pipe, as determined by the Contracting Officer, is encountered in the bottom of the trench, such material shall be removed to the depth required and the trench backfilled to the proper grade with compacted pipe bedding material as specified in Paragraph 11-04 below. Where the pipe will be completely or partially surrounded by compacted highway fill, the fill shall be placed in accordance with the applicable specifications to a level 2 feet higher than the top of the pipe or to finished subgrade level, whichever is lower, and a trench shall then be excavated as described above, except where the highway fill consists of rockfill material, in which case the trench shall be excavated to a minimum overdepth of 12 inches below the trench depths indicated or specified and the overdepth shall be filled with compacted pipe bedding material. The bottom of the trench for any pipe over 24 inches in diameter shall be shaped to conform with the outer surface of the pipe to a minimum height of 6 inches above the pipe invert so that the pipe will rest firmly on undisturbed soil or pipe bedding for as nearly the full length of the barrel as proper jointing operations will permit.

c. Excavation for Appurtenant Structures. - Excavation for drain inlets and similar structures shall be sufficient to leave at least 24 inches in the clear between the outer surfaces and the embankment or timber that may be used to hold and protect the banks. Any overdepth excavation below such appurtenances that has not been directed by the Contracting Officer will be considered unauthorized and shall be refilled with pipe bedding or concrete, as directed, at no additional cost to the Government.

11-03. STREAM DIVERSION. - a. Large Culverts. - The control and diversion of water in connection with the three large culverts is specified and included under Section 2, "CONTROL AND DIVERSION OF WATER".

b. Other Culverts and Drains. - All streams which may interfere with the proper construction of the culverts and appurtenant structures shall be diverted during the construction period by methods approved by the Contracting Officer.

c. Excavation. - No excavation or diversion will be permitted close enough to a pipe excavation to interfere with the specified width of pipe bedding and culvert backfill.

11-04. MATERIALS. - a. Pipe Bedding. - Material for use as pipe bedding shall meet all the requirements, including approval, as stated in Section 5, "EMBANKMENTS, DAM AND DIKE" for sand fill material except that the pipe bedding material shall contain no stones larger than 3 inches in any dimension.

b. Culvert Backfill. - Material for use as culvert backfill for the large culverts at the Vinica Brook and Conant Brook crossings and in the vicinity of Station 62+50 on the Wales Road relocation shall meet all the requirements, including approval, as stated in Section 5, "EMBANKMENTS, DAM AND DIKE" for gravel fill material except that the culvert backfill material shall contain no stones larger than 4 inches in any dimension.

c. Earth Backfill. - Materials for use as earth backfill for all culverts other than the three large culverts and for appurtenant structures shall consist of approved earth materials from the trench excavations, other required excavations, or borrow excavation from which all oversize stones as defined in Paragraph 11-05 have been removed.

11-05. PLACEMENT AND COMPACTION. - a. Pipe Bedding. - In general, approved pipe bedding material shall be dumped and spread in approximately horizontal layers not over 6 inches in thickness and each layer shall be compacted with 6 coverages of the tread of a crawler-type tractor weighing at least 20,000 pounds. In areas where the tractor cannot operate due to space limitations, pipe bedding material shall be spread in 4-inch layers and compacted with the power tamper or surface vibrator specified in Section 5 "EMBANKMENTS, DAM AND DIKE", in the manner specified in the same section for the compaction of gravel backfill. Pipe bedding material for the three large culverts shall be placed and compacted for the full heights indicated on the drawings and then re-excavated to provide a shaped surface for the bottom of the pipe conforming to the surface of the pipe bottom. Pipe bedding material for all other pipes larger than 24 inches in diameter shall be placed and compacted to at least 6 inches above the pipe invert grade and similarly re-excavated. Pipe bedding material for pipes having

diameters of 24 inches or less shall be placed and compacted to pipe invert grade. Shaping of the pipe bedding as specified above shall be done manually by men skilled in this type of work in such a manner that the pipe shall rest firmly on compacted bedding material for as nearly the full length of the barrel as proper jointing operations will permit. The shaping of the bedding shall be done only a few feet in advance of the laying of the pipe. Areas in which pipe bedding is to be placed shall be dewatered completely prior to placement of the pipe bedding material.

b. Backfilling. - (1) General. - No backfill for any culvert or appurtenant structure shall be placed until the foundation clean-up, pipe bedding as required, and installation of the pipe or structure have been completed and approved and until the unit, as installed, conforms to the requirements specified herein and in other pertinent sections of the specifications. All backfill areas shall be completely dewatered prior to placement of backfill.

(2) Backfilling for Large Culverts. - Backfilling for the large culverts at the Vinica Brook and Conant Brook crossings and in the vicinity of Station 62+50 on the Wales Road relocation shall be performed to the lines, grades, and cross sections indicated on the drawings or as modified by the Contracting Officer. Backfill materials for these culverts shall consist of approved culvert backfill material spread by hand shoveling in approximately horizontal layers not exceeding 4 inches in thickness and compacted by power tamper or surface vibrators in the manner specified for gravel backfill in Section 5 "EMBANKMENTS, DAM AND DIKE". Special means shall be used to maintain the surface of the backfill at the same level on both sides of the pipe at all times so as to prevent movement or distortion of the pipe. Special care shall be exercised to obtain thorough compaction of the backfill material under the haunches of the pipe. During spreading of the culvert backfill material all stones larger than 3 inches in any dimension shall be removed from those portions of the layer within 12 inches of the outer surface of the pipe. Layers of backfill placed 24 inches or more above the top of the pipe may be compacted by 6 coverages of the rear wheels of an approved rubber tired farm tractor weighing 2 tons or less in lieu of compaction by power tamper or surface vibrator. The rate at which culvert backfill is placed and compacted shall be such that the backfill surface shall be at least 6 inches and no more than 24 inches above that of the adjacent highway fill. Layers of highway fill material spread within 20 feet of the sides of the pipe shall be compacted only by the crawler type tractor, power tamper, or surface vibrator. No compaction or hauling equipment shall be allowed to operate on any layer of culvert backfill material other than the power tamper, surface vibrator, or rubber tired farm tractor.

(3) Backfill for Other Culverts. - (a) Lower Portion of Trench. - This subparagraph covers the backfilling for culverts (other than the three large culverts covered in (2) above) up to the level of the finished subgrade or to a level 2 feet above the top of the pipe, whichever is the lower. The lower portion of the trench shall be backfilled with approved earth backfill material from which all stones larger than 3 inches have been removed. The material shall be spread by hand in approximately horizontal layers not exceeding 4 inches in thickness. Each layer shall be compacted as specified for the culvert backfill in (2) above. Beneath the pipe haunches where there is not adequate space for the proper operation of the power tamper or surface vibrator, small hand tools shall be used to firmly compact the backfill materials.

(b) Remainder of Trench. - Backfill placed in the upper portions of the trenches covered in (a) above shall consist of approved earth backfill material from which all stones larger than 6 inches in any dimension have been removed. Each layer shall be spread to a thickness no greater than 6 inches and compacted as specified for the culvert backfill in (2) above.

(4) Appurtenant Structures. - Backfilling for inlets and other appurtenant structures shall be placed and compacted as specified in (3)(a) above for backfilling for culverts.

11-06. MEASUREMENT AND PAYMENT. - a. Large Culverts. - All excavations for the large culverts at the Vinica Brook and Conant Brook crossings and in the vicinity of Station 62+50 on the Wales Road relocation will be measured and paid for in accordance with Section 3, "EXCAVATION" under Item 3, "Unclassified Excavation - General", and Item 5, "Rock Excavation". The quantities of compacted pipe bedding and compacted culvert backfill to be paid for will be the volumes computed from the lines, grades, thicknesses, and limits indicated on the drawings, specified herein, or modified by the Contracting Officer. The limits of sections of bedding and backfill which are not definite on the drawings or as stated in these specifications and depend upon topography and field conditions shall be determined by field surveys. The measurement shall not include volumes of materials placed outside the limits shown on the drawings, specified, herein, or directed by the Contracting Officer. Compacted pipe bedding and compacted culvert backfill satisfactorily placed and measured as stated above will be paid for at the applicable contract unit prices per cubic yard for Item 36, "Pipe Bedding" and Item 36A, "Culvert Backfill". Such payment shall constitute full compensation for all work in connection with placement, compaction, furnishing materials, and all other incidental work required for the construction, protection, and maintenance of backfill and bedding sections. Payment for Item 36, "Pipe Bedding" shall also include full compensation for the shaping of the bedding surface to fit the bottom of the pipe. Stream diversion is specified and included under Section 2, "CONTROL AND DIVERSION OF WATER".

b. Other Culverts and Appurtenant Structures. - No separate payment will be made for stream diversions, excavation, trenching, and backfilling for culverts and drains and appurtenant structures (other than the three culverts covered in a above) except as otherwise specified below. This work shall constitute a subsidiary obligation of the contractor and payment therefor will be included in the applicable contract unit price for the particular culvert or structure involved. Any rock excavation encountered will be classified and measured for payment and paid for as specified for rock excavation in Section 3, "EXCAVATION" except that all boulders measuring over 1/2 cubic yard will be classified as rock excavation. Pipe bedding as required for these culverts, including material to replace removal of unsuitable material from trench bottoms, will be measured for payment as the number of cubic yards actually placed and will be paid for as specified in a above.

SECTION 12

STORM DRAINAGE SYSTEM (Items 28 through 35, inclusive, and 52)

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SECTION 12

STORM DRAINAGE SYSTEM

(Items 28 through 35, inclusive and 52)

12-01. SCOPE. - This section covers the storm drainage system, including pipe culverts and drains, drop inlets, aprons, and concrete collars, complete.

12-02. GENERAL. - All work and materials in connection with the construction of the storm drainage system shall conform to Sections D-1 and D-4 of the Massachusetts Standard Specifications (See Paragraph SC-60) except as hereinafter modified).

12-03. MATERIALS. - a. Pipe for culverts (15-inch through 54-inch, inclusive) shall be asphalt coated corrugated metal pipe. The 15-foot and 17-foot culverts shall be bituminous coated multi-plate pipe and shall conform to the requirements of Section D-4 and Addendum D-4 of the Massachusetts Standard Specifications.

b. Drop inlets (Type C) shall conform to the requirements of Section D-1 of the Massachusetts Standard Specifications and to the details of design as shown on the Massachusetts Construction Standards for Type "C" drop inlets.

c. Concrete for collars and drop inlets shall conform to the applicable portions of Section 9, "CONCRETE", of these specifications.

12-04. EXCAVATION, TRENCHING, BEDDING, AND BACKFILLING FOR PIPE AND DROP INLETS. - Excavation, trenching, bedding and backfilling for pipe and drop inlets shall be in accordance with the applicable portions of Section 11, "EXCAVATION, TRENCHING, AND BACKFILLING FOR PIPE CULVERTS AND DRAINS". Details are shown on the drawings of the methods and materials to be used in backfilling and compacting the trenches for the 54-inch, 15-foot and 17-foot diameter culverts.

12-05. ROCK SLOPE PROTECTION FOR APRONS. - Rock slope protection for aprons shall be in accordance with the applicable portions of Section 6, "ROCK SLOPE PROTECTION, GRAVEL BEDDING AND ROAD GRAVEL".

12-06. PAVED DITCHES. - Paved ditches shall be constructed as specified in Section D-8 of the Massachusetts Standard Specifications, except as otherwise specified. The ditch paving shall consist of a 9-inch gravel base and a 3-inch bituminous mixture paving. Gravel base shall conform to the requirements for gravel base courses for roads as specified in Section 4, "GRAVEL BASE AND SURFACE COURSES". Bituminous paving mixtures shall

conform to the material requirements specified in Paragraph 15-04 for top and binder course material. Gravel surface shall be primed as specified in Paragraph 15-03 prior to placement of the bituminous paving mixture. Bituminous mixture shall be placed in two courses (1-1/2 inch binder and 1-1/2 inch surface). Mixtures shall be well compacted using tampers weighing not less than 25 pounds and with a tamping face of 50 square inches or other approved methods. The surface of the top mixture after compaction shall be smooth and true to the indicated lines and grades.

12-07. REMOVAL OF DEBRIS FROM THE EXISTING CULVERTS. - Removal of debris from the existing culverts and cleaning shall be performed to the satisfaction of the Contracting Officer. Flow conditions shall be restored to allow the efficient entrance and discharge of storm water at the culverts. (See Paragraph 1-06).

12-08. PAYMENT. - a. Culverts and Drains, 30" and Smaller. - All storm drains and culverts with the exception of the 54-inch culvert and the 15-foot and 17-foot multi-plate culverts shall be measured for payment along the centerlines of the pipe from end of pipe to end of pipe or from the outside wall of drop inlets to the end of the pipe. Pipe will be paid for at the applicable contract unit price for Items 28 through 31, inclusive, "Pipe, ACCM", based on the number of linear feet of culverts or storm drains placed in the accepted work, payment of which will constitute full compensation for all pipe, joints, and bedding, including trenching and excavation (except rock), backfill and compaction and all incidental labor and material necessary to complete the construction of culverts or storm drains as required by this section of the specifications and all references included herein.

b. Drop Inlets (Type C). - Each inlet will be considered one complete unit. The quantity of inlets to be paid for will be the total number of inlets complete with frames and gratings constructed to the depths indicated on the drawings. Payment under Item 35, "Drop Inlets (Type C)", will constitute full payment for all excavation, form work, concrete, cement, reinforcing steel, backfill and compaction, materials, and labor necessary to complete the construction.

c. Three Large Culverts. - The 15-foot and 17-foot culverts will each be paid for at the applicable lump sum contract prices for Items 33 and 34, "Pipe, Culvert, Bituminous Coated Multi-Plate". The 54-inch culvert will be paid for at the lump sum price for Item 32, "Pipe, Culvert, ACCM, 54-inch". Payment for these items shall include all costs including bituminous multi-plate of corrugated pipe, as applicable, hook bolts, concrete collars and end walls including cement and reinforcing steel, and all incidental labor and materials necessary to complete the construction of these culverts as required by the drawings, this section of the specifications, and references included herein, except rock slope protection, stream diversion, excavation, bedding, filling and backfilling.

d. Rock Slope Protection and Gravel Bedding. - Rock slope protection and gravel bedding for aprons shall be measured in place and the quantity to be paid for shall be the number of cubic yards constructed to the dimensions shown on the drawings. Rock slope protection shall be paid for under Item 19, "Rock Slope Protection". Gravel bedding shall be paid for under Item 16, "Gravel Bedding". Payments will constitute full payment for all excavation and labor necessary to complete the construction.

e. Cleaning Culverts. - No separate payment will be made for removal of debris and cleaning of existing culverts where indicated. All work in connection with this work will be considered a subsidiary obligation of the contractor to be included under Item 1, "Preparation of Site".

f. Paved Ditches. - Paving will be measured in place by the square yard. Payment will be made at the contract unit price per square yard for Item 52, "Paved Ditches", which price shall include all costs in connection therewith, except excavation, necessary for complete construction of the paved ditches including foundation preparation and base course.

SECTION 13

BUBBLE GAGE SHELTER (Item 27) (Index)

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SECTION 13

BUBBLE GAGE SHELTER (Item 27)

13-01. SCOPE. - This section covers the Bubble Gage Shelter, complete, including concrete stairs and pipe railings.

13-02. DRAWINGS FOR APPROVAL. - Before furnishing door, including threshold and weatherstripping for door bottom, detailed shop drawings supplemented by descriptive data and the hardware schedule, shall be submitted for approval.

13-03. EXCAVATION AND BACKFILLING. - a. General. - All work shall be executed to the lines and grades shown on the drawings or approved by the Contracting Officer.

b. Excavation. - Except as otherwise specified in Section 6, ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL, the dam embankment shall be completed prior to excavation required for construction of the Bubble Gage Shelter. Excavation required for the construction of the Bubble Gage Shelter shall not proceed until directed by the Contracting Officer. Excavations shall conform to the dimensions and elevations shown on the drawings. Where the excavation is made below the elevations indicated on the drawings or directed, the heights of the wall shall be increased, as directed. Excavation shall generally extend 24 inches outside the walls to allow for placing and removal of forms, installation of the bubble gage conduit, floor drain pipe, and for inspection. Undercutting will not be permitted.

c. Bubble Gage Shelter Fill. - Bubble gage shelter fill shall consist of material conforming to the requirements as specified in Section 5, EMBANKMENTS - DAM AND DIKE, for gravel fill. Prior to the placement of bubble gage shelter fill, foundation walls shall be completed, all forms shall be removed, and the foundation areas for the fill shall be cleared of all trash and debris. Bubble gage shelter fill to be placed in the areas beneath the stairways and in areas contiguous thereto for a horizontal distance of 3 feet shall be placed and compacted as specified for gravel backfill in Section 5, EMBANKMENTS - DAM AND DIKE. All other gage shelter fill shall be placed in 12-inch layers without compaction other than that incidental to construction operations. Bubble gage shelter fill shall not be placed adjacent to the bubble gage shelter until at least 14 days after its completion.

d. Rock Slope Protection. - Rock slope protection material to be placed in the trench provided for the gage conduit, and as a result of the construction of the bubble gage shelter, shall meet all of the requirements for rock slope protection as stated in Section 6, ROCK SLOPE PROTECTION, GRAVEL BEDDING, AND ROAD GRAVEL, except as otherwise specified herein. Rock slope protection material in the trench provided for the

gage conduit, in the immediate vicinity of the bubble gage shelter and in other limited areas shall be placed by hand. Extreme care should be exercised to prevent damage to the gage conduit, discharge pipe for floor drain, or the bubble gage shelter. The rock slope protection shall not be placed adjacent to the bubble gage shelter until at least 14 days after its completion.

13-04. CONCRETE. - All concrete work required for the building and stairs shall conform with the applicable requirements of Section 9, CONCRETE.

13-05. MISCELLANEOUS METALS. - a. Metal Threshold. - The door threshold shall be an interlocking weatherstrip type threshold, 5" x 5/8", fabricated from non-ferrous metal with a non-slip top surface, shall be bedded in calking compound, and shall be anchored to the concrete by means of bolts set in expansion sleeves.

b. Weatherstripping. - Materials in connection with weatherstripping door bottom shall be No. 9 gage standard sheet (not ribbon) zinc, cut across the grain. Weatherstripping shall not react against type of threshold furnished.

c. Channel Frame. - Frame for door shall be structural steel channel. Stop shall be of structural steel bar stock plug welded to channel jams and head. Frame shall be provided with four anchors to each jamb. Frame shall be notched as required to receive hardware.

d. Floor Drain. - The contractor shall furnish and install a floor drain and discharge piping. Discharge piping shall extend into rock slope protection. Discharge pipe shall conform to Federal Specification SS-P-356, 4-inch. Floor drain shall conform to Federal Specification WW-P-541b, type 224, 4-inch pipe discharge.

13-06. PIPE RAILINGS. - All pipe railing at Bubble Gage Shelter, including railing along stairs, shall be standard weight mild steel pipe conforming to Federal Specification WW-P-406b, except that bend sections shall conform to Federal Specification WW-P-404c. Pipe shall be 1-1/2 inch standard weight. All pipe shall be hot dip galvanized after manufacture.

a. Fabricated. - Jointing of post rail and corners shall be by mitered and welded type joints.

(1) Mitered and welded joints shall be made by fitting post to top rail and intermediate rail to post, mitering corners, grooving welding joints and grinding smooth. Railing splices shall be butted and reinforced by a tight-fitting interior sleeve not less than 6 inches long.

(2) Railing may be bent at corners in lieu of mitering and welding or by using fittings, provided all such bends are made in suitable jigs and that the cylindrical cross section of the pipe be maintained through the entire bending.

b. Anchorage. - Posts shall be set into 6-inch sleeve inserts set and anchored in the concrete. Posts shall be inserted in sleeves, leveled, plumbed and calked solid with molten lead or lead wool and anchorage joint shall be covered with pipe collar pinned to post. Ends of rails shall be secured by means of standard steel pipe flanges anchored to concrete with expansion bolts.

13-07. STEEL LADDER. - Steel ladder shall be of the bar and rung type, constructed of structural steel in accordance with the details and the following minimum requirements. Stringers shall be a minimum 3/8-inch by 2-1/2 inch mild steel bars fitted with anchors, as shown, for securing to concrete. Rungs shall be 3/4 inch minimum round, solid section steel rods, fitted into punched holes in stringers, welded and ground smooth. Ladder shall be secured at each end. Install galvanized pipe grab bar where indicated.

13-08. METAL GRATINGS AND FRAMES. - Metal gratings shall conform to the requirements of Federal Specification RR-G-661a, Type I. Edges of all gratings shall be banded, and all gratings shall be hot dip galvanized. Frames shall be of standard steel angles and shall be all-welded construction, and galvanized to match gratings. Frames shall be provided with welded-on anchors.

13-09. HOLLOW METAL DOOR. - a. General. - The contractor shall furnish all material and hardware for, and install complete, the entrance door as indicated on the drawings. Door shall be provided with two insect screened weatherproof louvers. Screens shall be of non-ferrous metal and shall be on rewirable frame.

b. Material. - All material, except as otherwise specified, shall be factory fabricated from leveled steel, shall conform to ASTM A 366-62T; face plate shall be 1/4-inch steel plate or 3 gage sheet steel conforming to ASTM A 366. Gages referred to are all U. S. Standard and are the minimum acceptable for this work. Door shall be of the flush type, hollow metal construction, 2-inches thick. Except for exterior face plate and as otherwise specified, all material shall be of 16-gage stock. Top and bottom of door shall have stiffener channels welded to side plates, and shall be reinforced by formed steel, Z-bar sections extending full height and spaced not over 6 inches on centers. Sound-deadening cork board strips shall completely fill each space. Exposed welds shall be ground to true, even plane with no grinding marks visible. Door shall be free from warps, dent, or buckles. Door shall be properly reinforced for hardware and shall be drilled and tapped for application of hardware. Backing for hardware shall be not less than 1/8-inch thick

and heavier where necessary to develop full strength of machine screws. Door shall be mortised for butts and reinforcement provided by door manufacturer. Joints and miters shall be welded full length of hair line joints. Fourteen-gage reinforcements shall be provided for lock and lock strike. All reinforcements shall be securely welded in place. Mortises shall be neat and carefully fitted to hardware items. Any voids between metals and all mortises where hinges pass through rebates shall be filled with metal welded in place. A weather drip strip of 1/8" x 2" bent galvanized steel shall be applied to bottom and set to clear threshold.

c. Louver Guards. - Door guards shall be 1-1/2 inch wire mesh square grilles composed of 3/16" x 1/16" flat wire. The ends of mesh shall be hooked and welded to a 3/8-inch diameter steel frame. Steel strap lugs, 1/8-inch thick by 1-1/2 inch wide, shall be bent around and welded to bar frame; straps shall be provided at each corner and not over 18 inches apart elsewhere. Straps shall be bolted to door with 3/8-inch carriage bolts or prison-type bolts extending through the door. In any event fastenings shall be made tamperproof.

d. Painting. - The door including grilles and louvers shall be shop painted in accordance with the standard practice of the manufacturer. The door before assembling shall be cleaned, filled and ground smooth, where necessary, given a phosphate treatment, and primed with one shop coat of rust resistant paint standard with manufacturer. The door shall be finish painted as specified in Paragraph, PAINTING.

e. Hardware. - The door shall open from the left, and shall have 1-1/2 pairs of butts and a lockset as follows:

Butts - 1/2 pair, Type T-2147 USP, 5", non-rising, non-removable pins when door is closed (weld jamb leaf). (Federal Specification FF-H-116c). Olite bearing butts may be furnished at contractor's option. The type shown is minimum; actual thickness of metal and pin diameter as required to properly support door.

Lock, Type 86 EW-5S (Federal Specification FF-H-106a).

13-10. GAGE CONDUIT. - The contractor shall furnish and install under this section, the pipe conduit for the gage recording system. Conduit including fittings and bends, shall conform to Federal Specification WW-P-406a, Weight A, Class 2. Pipe shall be laid so that no low points occur along the line of the pipe. Pipe shall be provided with taper-threaded ends and joints by zinc-coated couplings. The joints shall provide a watertight joint. The contractor shall delay placing rock slope protection in locations where the conduit is to be placed until conduit has been placed. Care shall be exercised in placing rock slope protection in order to avoid damage to pipe, including galvanizing treatment, and to avoid any change in the line and grade of the pipe. The interior of the conduit shall be free from obstructions. The contractor shall install a No. 10 pulling wire in the conduit. Gage inlet shall be as indicated; all bolts and washers shall be corrosion resisting steel.

13-11. WOOD SHELF. - Shelving, including supports and nailers, of thickness indicated shall be free from knotholes, loose or unsound knots, wane, decay, and splits longer than the width of the piece. Shelving, including supports, etc., shall be pressure treated in accordance with Federal Specification TT-W-571g.

13-12. PAINTING. - a. All ferrous metal items specified in this section, including door, door frames and ladders, shall be painted. Galvanized metal and wood surfaces shall not be painted. Corrosion resisting steel shall not be painted.

b. All ferrous metals, unless specified to receive special partial treatment in the place of manufacture, shall be solvent cleaned and wire brushed followed by one prime coat of red lead paint conforming to Federal Specification TT-P-86c, Type I. All ferrous metal surfaces shall receive two finish coats of synthetic gloss enamel conforming to Federal Specification TT-E-486c and Am-3, Class A. In lieu of specified treatment, door may be completely finish painted in the shop in accordance with manufacturer's practice where specifically approved. Color of all finish paint shall be 16492-Gray (Fed. Std. No. 595).

13-13. BRONZE PLAQUE. - a. General. - The contractor shall furnish and install a bronze plaque where shown and as hereinafter specified.

b. Materials. - (1) Bronze casting shall conform to Federal Specification QQ-L-225, composition standard with manufacturer.

(2) Other items shall conform to the current standard practice for material required and use intended.

c. Construction. - The size and thickness of the plaque are indicated. The plaque border shall be raised and the edge shall be beveled. Both the raised border and the beveled edge shall be polished a bright finish. The plaque background shall have a sunken, matte surface with a statuary bronze finish. The letters shall be hand tooled, flat faced and polished to a bright finish. The plaque shall be furnished with four expansion bolts for securing to wall and with four rosettes.

13-14. PAYMENT. - Payment for all work specified in this section including cement, reinforcement and concrete pipe conduit and inlet for gage, plaque, railings, floor drain and discharge piping, excavation and backfilling, and painting and all costs in connection therewith shall be included in the lump-sum contract price for Item 27, "Bubble Gage Shelter".

SECTION 14

MISCELLANEOUS ITEMS OF WORK (Item 37 through 43, Inclusive) (INDEX)

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SECTION 14

MISCELLANEOUS ITEMS OF WORK (Item 37 through 43, Inclusive)

14-01. SCOPE. - The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials, and in performing all operations in connection with miscellaneous work items listed below, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

14-02. CHAIN LINK FENCING. - a. General. - Chain link fencing, four feet in height, and chain link gates shall be installed where and as shown on the drawings or directed. Fencing shall conform to Drawing No. 40-16-08, attached at end of this section. Fencing shall be braced at changes in directions and at ends, in accordance with manufacturer's recommendations.

b. Material and Description. - (1) Posts shall be galvanized and shall be in accordance with Federal Specification RR-F-183. The line posts shall be spaced not more than 10 feet on centers and embedded in the manner and depth shown on the drawings. All posts shall have an ornamental ball top.

(2) The fencing fabric shall conform to the requirements of Federal Specification RR-F-191a, Type A. The fencing shall be set to line and grade as shown on the drawings or as directed. The fence shall have a top rail and a tension wire along bottom of fabric.

(3) Aluminum fabric ties of suitable gage shall be provided for attaching the wire mesh to the posts.

(4) Gates shall be constructed with malleable iron fittings securely braced and trussed up with welded connections. Gates shall be filled with fabric to match fencing. Gates shall be equipped with pivot type malleable iron hinges, padlock, keepers, gate shoe and stops. Gates shall be equipped for locking at the top, middle, and bottom with the middle lock arranged for padlocking. A padlock with chain and three keys (and conforming to Federal Specification FF-P-101c, Type EPC, size 2 inch) shall be provided for each set of gates. All padlocks shall be keyed alike.

(5) A "closed" sign shall be mounted on each leaf of each set of gates. The signs shall be made of galvanized sheet steel (12 gage) properly reinforced. All surfaces shall be primed and then finished with two coats of exterior white paint. Lettering shall be done by a sign painter using a reflectorized type of paint.

(6) The fencing shall be constructed and installed as herein specified and in accordance with the best methods for workmanship adopted for this type of work in accordance with manufacturer's instructions and shall be pursued to a satisfactory completion as approved by the Contracting Officer.

c. Payment. - Payment for furnishing and installing chain link fencing (except gates) will be made at the contract unit price per lineal foot for Item 38, "Chain Link Fencing", measured along the fence line between the end posts, width of gates shall not be included. Payment for furnishing and installing each set of gates, complete with signs, will be made at the contract unit price each for Item 39 "Gates - 12 feet, Chain Link". The contract prices shall include all costs in connection with earth and rock excavation, concrete foundations, and grouting sockets.

14-03. LOG BOOM. - a. General. - The contractor shall furnish, construct, and erect a log boom at the location upstream of the dam as indicated on the drawings.

b. Materials. - (1) Boom logs shall be white pine or spruce having a minimum diameter of 10 inches at the tip and shall be furnished in 18-foot to 20-foot lengths except the maximum length shall be reduced as required to follow final finish grade and existing contours, and to avoid abrupt changes. Logs shall be sound, straight, free from rot, shall be clean peeled, and shall be approved prior to use. To the extent such logs are available, the contractor shall use logs obtained in the course of clearing operations. Clean peeling of logs shall conform to the requirements of Paragraph 6.8.4 of Federal Specification MM-P-371a.

(2) Steel piles shall be structural steel beams and conform to ASTM A 36-62T.

(3) Boom and auxiliary cable shall be new 3/4-inch galvanized wire rope, 3-strand, 7 wires to the strand, conforming to the requirements of Federal Specification RR-W-420, preformed.

(4) Boom chains shall conform to Federal Specification RR-C-271a, Type I, grade C, class 4, welded steel, proof coil chain, 1/2-inch size and approximately 5-1/2 feet long, overall. The rings and toggles shall meet the same specifications as for the boom chains. Chain, rings, and toggles shall be galvanized.

c. Construction. - A hole approximately 2-1/4 inches in diameter shall be bored through each end of the log. The logs shall be connected end to end by passing the boom chains through the bored holes and the whole assembly reinforced by threading the 3/4-inch wire rope through the rings of the boom chains. The ends of the cable shall be anchored to the steel

piles as shown on the drawings. Piles shall be driven to required depth in an approved manner. Exposed portions of piles shall be painted as hereinafter specified for trash rack structure.

d. Payment. - Payment for the log boom complete as specified will be made at the contract lump sum price for Item 40, "Log Boom", and shall include all costs in connection therewith including all metallic items, mastic coating, end anchorages, and galvanizing.

14-04. STAFF GAGES. - a. General. - The staff gages shall be installed at the locations indicated on the drawings and in accordance with the design and dimensions shown on the drawings. All excavation and backfill shall be performed and included under this paragraph.

b. Construction. - Staff gages shall be erected to the sizes and at locations indicated, except that the lengths of individual gage strips if not furnished in single section shall be provided with additional grommets on each side of the joint. The facing and back, including all edges, of each staff gage section shall be given an acid-resistant porcelain enamel finish over a 16-gage metal material of standard manufacture. A sample of the facing at least 2 feet long shall be submitted for approval before erection. The staff gages shall be set in concrete as directed. No concrete shall be set under posts. Concrete shall conform to applicable requirements of Section, CONCRETE. Posts shall be of S4S No. 1 structural long leaf yellow pine conforming to the grading rules of the Southern Pine Association. Posts shall be given a pressure preservative treatment using a creosote-coal-tar solution conforming to Federal Specification TT-C-650b, Class I or II. Preservative treatment process shall conform to Federal Specification TT-W-571g. Other materials shall be as shown on the drawings or as required.

c. Payment. - Payment for all work in connection with furnishing and installing staff gages will be made at the contract lump sum price for Item No. 41, "Staff Gages", which price shall include preservative treatment, posts, excavation and backfill, concrete and cement.

14-05. MISCELLANEOUS METAL ITEMS-INTAKE AND OUTLET STRUCTURES. - a. General. - This paragraph covers all metal work at the intake and outlet structures, except items specifically specified elsewhere, and includes pipe railing at inlet and outlet structures and trash racks and supports. Shop drawings shall be submitted for trash racks as required.

b. Pipe Railing. - Pipe rails shall be steel pipe conforming to Federal Specification WW-P-406b, weight A, Class 1, except that bend sections shall conform to Federal Specification WW-P-404c. Fabrication and anchorage shall conform to Paragraph 13-07.

c. Structural Steel. - Structural steel shall conform to ASTM Standard A36-62T.

d. Hollow Structural Tubing. - Hollow structural tubing shall be fabricated of structural steel conforming to ASTM Standard A 36-62T. Wall thickness shall be 1/4 inch.

e. Metal Fasteners. - Metal fasteners and bolts shall be provided hereunder where necessary and as required for completion of the work.

f. Installation. - The work shall be installed in a first class workmanlike manner. Plates and parts or devices necessary for proper installation, whether or not fully detailed on the drawings, shall be furnished and placed by the contractor. Welding shall conform to the American Welding Society Standard Code D1.0.

g. Painting. - The metal items for the intake structure shall be painted as specified in Paragraph 14-06 below. Painting of pipe railing at outlet structures shall conform to Paragraph 13-12 b.

h. Payment. - Payment for all work specified in the paragraph and all costs in connection therewith, including painting, as specified in Paragraph 14-06, will be made at the contract lump sum price for Item No. 37, "Miscellaneous Metal Items - Intake and Outlet Structures."

14-06. EPOXY COATING - FIELD APPLIED. - a. General. - Epoxy resin material, Type I or II as applicable, shall conform to Federal Specification MMM-G-00650 (ARMY CE) "Grout (Adhesive), Epoxy Resin Base, Flexible, Filled", and shall be field applied to the miscellaneous metal items of the intake structure as specified in Paragraph 14-05g.

b. Surface Preparation. - Surface upon which epoxy resin is to be applied shall be cleaned to bare metal by dry sandblasting with approved equipment and methods followed by air cleaning with filtered air. The application of epoxy resin shall be accomplished immediately following cleaning.

c. Application of Epoxy Resin Binder. - The epoxy resin binder material shall be applied when the ambient temperature is at or above 60° F. and the relative humidity is less than 70 percent. This environment shall be artificially created if necessary. The epoxy resin shall be mixed and applied in accordance with the manufacturer's recommendations. The epoxy shall be applied on a clean, essentially free of dust, warm, and dry metal surface so that it will completely cover the surface with a 15 mil thickness. The epoxy resin shall be cured to attain set hardness and a temperature and humidity environment shall be maintained until the epoxy resin has hardened.

d. Payment. - No separate payment will be made for the work specified in Paragraph 14-06 and all costs in connection therewith shall be included in the lump sum contract price for Item 37, "Miscellaneous Metal Items - Intake and Outlet Structures".

14-07. HIGHWAY GUARD RAIL. - Highway cable guard rail shall be installed where and as indicated on the drawings.

a. Highway Cable Guard Rail. - Highway cable guard rail shall be 2-cable type guard rail (type C-2-C) with concrete posts conforming to the requirements of the Massachusetts Standard Specifications, Section E-2, and the Massachusetts Construction Standards (see Paragraph SC-60), except as otherwise specified or indicated on the drawings.

b. Measurement and Payment. - Guard rail will be measured for payment by the linear foot of cable guard rail satisfactorily installed between centerlines of end posts. Payment will be made at the contract unit price for Item 42, "Cable Guard Railing", which price shall include all costs in connection with constructing the guard rail complete, including end and intermediate anchorages, dummy posts, and painting.

14-08. BUMPER GUARD. - a. General. - Bumper guard shall be furnished and installed at the parking area where indicated on the drawings. Hardware shall be galvanized commercial stock supply.

b. Materials. - (1) Wood Posts. - The posts shall be of seasoned white oak, cedar, locust or tamarack, sound and cut from live timber. Rectangular posts shall be eight inches by six inches and six (6) feet long. Round posts may be used at contractor's option and shall be eight inches in diameter and six feet in length. They shall be shaved to even surface and free from bark or skin.

(2) Rails. - The plank for horizontal rails shall be seasoned spruce or other approved wood, planed on four sides, of the dimensions indicated on the drawings.

(3) Preservative Treatment. - Posts and rails shall be pressure-preservative treated with oil-borne preservative in a closed retort in conformance with Federal Specification TT-W-571g & Am-1, to a minimum net retention of preservative of 6 pounds per cubic foot. Treated materials, cut or bored after treatment, shall have cut and bored surfaces well brush coated with preservative used in the treatment. Wood shall be clean and free from surface oil prior to treatment.

c. Installation. - The guard rail shall be constructed in accordance with the drawings, with the posts set vertically and accurately aligned. The post holes shall be backfilled with suitable material,

thoroughly tamped in layers of not more than six inches. The plank rail shall be properly secured to the posts with carriage bolts as indicated on the drawings. Joints in rails shall occur at posts.

d. Painting. - Posts and rails shall receive two coats of paint allowing a minimum of three days of clear weather between coats. Black paint (Federal Specification TT-P-61, Type B) shall be used from ground line to bottom of rail. White paint (Federal Specification TT-P-102) shall be used for painting rails and remainder of posts.

e. Payment. - Payment for furnishing and installing bumper guard will be made at the contract unit price per linear foot for Item 43, "Bumper Guard", measured along the guard rail from center of end post to center of end post. The contract price shall include all costs in connection with earth and rock excavation, backfill, painting, and concrete grout.

14-09. EXISTING FENCES - REMOVED AND RESET. - a. General. - Wherever indicated on the drawings or directed by the Contracting Officer, the present fencing, including gates, located in areas to be graded shall be removed and reset in new locations. As required, temporary fencing shall be installed prior to relocation of existing fencing to provide maximum protecting and enclosure of cattle, horses, chickens, etc.; if necessary, the contractor shall provide new fencing and gates to match existing as to height and type if it is not feasible to relocate existing.

b. Payment. - No separate payment will be made for the work specified in this paragraph and all costs in connection therewith shall be included in the contract lump sum price for Item 1, "Preparation of Site".

14-10. MAIL BOXES, SIGNS, ETC., REMOVED AND RESET. - a. General. - Wherever indicated on the drawings or directed by the Contracting Officer, the present street signs, rural mail boxes, paper boxes, signs, etc., located in areas to be graded, or in areas inaccessible after construction of new work shall be removed and reset in new locations.

b. Installation. - If necessary during construction, mail boxes shall be set in temporary locations, as directed, so that they are satisfactorily available to the mail carrier.

c. Payment. - No separate payment will be made for the work required under this paragraph and all costs in connection therewith including excavation and backfill shall be included in the applicable contract price for Item 1, "Preparation of Site".

14-11. CONCRETE BOUNDS. - Concrete bounds shall be furnished and set at locations shown on the drawings or where directed by the Contracting Officer. Concrete bounds shall be furnished and set in accordance with the applicable provisions of Section G-8 of the Massachusetts Standard Specifications. The bounds shall be constructed to the standards established by the Hampden County Engineer. Each bound shall be measured as a single item. Payment will be made at the contract unit price each for Item 51, "Concrete Bounds", which price will include full compensation for furnishing and setting the bounds complete as specified in Section G-8.

SECTION 15

BITUMINOUS CONCRETE PAVEMENTS (Items 45, 45A, and 47) (INDEX)

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SECTION 15

BITUMINOUS CONCRETE PAVEMENTS (Items 45, 45A, and 47)

15-01. SCOPE. - This section covers the construction of hot-mix bituminous concrete pavement including the application of a bituminous prime coat on a previously prepared gravel base course, and construction of bituminous concrete berms, complete. Paved ditches are specified and included under Section 12.

15-02. DESCRIPTION. - The 2-1/2-inch pavements shall be constructed on the primed base in two courses consisting of a 1-1/4-inch binder base course and a 1-1/4-inch surface (top) course. The 2-inch pavements shall be constructed on the primed base in a single surface (top) course. Berms shall be of shape and size shown on drawings.

15-03. PRIME COAT. - Prime coat shall be applied on the gravel base course in accordance with the requirements of Section 16, "BITUMINOUS PRIME COATS AND SURFACE TREATMENTS".

15-04. BITUMINOUS CONCRETE PAVEMENT. - The binder and surface courses shall conform to Section B-18, Class I Bituminous Concrete Pavement, Type I-1, standard binder and top courses, respectively, of the Massachusetts Standard Specifications, as revised April 1962, and as hereinafter specified.

a. Pavement Thickness. - Pavement thickness shall be as indicated on the drawings.

b. Job Mix Formulas. - The contractor shall submit for approval, not less than 15 days prior to contemplated use, proposed job mix formulas conforming to the requirements of the above-noted specifications with the added provision that the gradation and batch weight of each hot bin utilized in developing the job mix formula shall be furnished.

c. Junctions of New and Existing Pavement. - New pavement shall meet existing pavements at locations shown. The junction shall be neatly made to the approval of the Contracting Officer.

15-05. BITUMINOUS CONCRETE BERMS. - Bituminous concrete berms shall be constructed using dense mix material and shall be of the shape and size shown on the drawings and shall conform to the relevant requirements of Section B-18, of the Massachusetts Standard Specifications. The mixture shall be placed and compacted with a machine acceptable and approved by the Contracting Officer for dense mix.

15-06. PAYMENT. - a. Bituminous Concrete Pavements. - Measurement for the pavements will be by the square yard. Payment will be made at the applicable contract unit prices for Item 45, "Bituminous Concrete Pavement, 2-inch" and Item 45A, "Bituminous Concrete Pavement, 2-1/2-inch", which prices shall constitute full compensation for all work involved including preparing and/or conditioning the base course and the prime coat.

b. Bituminous Concrete Berms. - Measurement will be by the linear foot of berm acceptably placed. Payment will be made at the contract unit price for Item 47, "Bituminous Concrete Berms", which price shall include all costs in connection with furnishing and placing the berms.

SECTION 16

BITUMINOUS PRIME COATS AND SURFACE TREATMENTS (Item 46)

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SECTION 16

BITUMINOUS PRIME COATS AND SURFACE TREATMENTS (Item 46)

16-01. SCOPE. - This section covers bituminous surface treatments, complete, including prime coats for bituminous surface treated roads and shoulders. In addition, this section covers prime coat for bituminous concrete surfaced roads.

16-02. DESCRIPTION. - a. Bituminous Surface Treated Roads and Shoulders. - The roadway surfaces shall receive a prime coat and a double bituminous surface treatment as hereinafter specified. Where berms are not required, shoulder areas shall not receive a prime coat or bituminous surface treatment. Shoulder areas adjacent to berms however, shall receive a prime coat and a double bituminous surface treatment as applied to roadway surfaces. Surface treatment of the shoulders shall be accomplished after construction of the bituminous concrete berms.

b. Bituminous Concrete Surfaced Roads. - The base courses for all bituminous concrete pavements shall receive a prime coat prior to placing the bituminous concrete.

16-03. APPLICABLE PUBLICATIONS. - The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

a. Federal Specification. -

SS-A-671a Asphalt; Cut-Back (for) Road-Work.
& Am-1

b. American Society for Testing and Materials Standards. -

C 131-55 Test for Abrasion of Coarse Aggregate
 by Use of the Los Angeles Machine.
C 136-63 Test for Sieve or Screen Analysis of
 fine and Coarse Aggregates.
D 75-59 Sampling Stone, Slag, Gravel, Sand, and
 Stone Block for Use as Highway Materials.
D 140-55 Sampling Bituminous Materials.

c. American Association of State Highway Officials Standard. -

T 102-57 Spot Test of Asphaltic Materials.

16-04. MATERIALS. - The materials used in the application of the prime coat and the bituminous surface treatments shall be mineral aggregate and the bituminous material, of the following types, gradations, grades, and consistencies, and shall meet the requirements of stripping and wear tests as specified.

a. Mineral Aggregate. - Mineral aggregate shall consist of crushed stone or crushed gravel, free from adherent films of clay, and shall be of such nature that a thorough coating of the bituminous material used in the work will not strip off upon contact with water. The moisture content of the aggregate shall not be sufficient to prevent it from being readily coated with the bituminous material. Drying may be required as directed.

(1) Crushed stone shall consist of clean, sound, durable fragments of stone, free from an excess of flat, elongated, soft, or disintegrated pieces and dust, and shall be free from dirt, or other objectionable matter.

(2) Crushed gravel shall consist of clean, sound, durable pieces, free from an excess of soft or disintegrated particles and dust, and shall be free from dirt or other objectionable matter. At least 90 percent by weight of the particles shall consist of at least two fractured faces.

b. Gradation of Aggregates. - The crushed stone or crushed gravel shall conform to the grading shown in table I. The gradation of the aggregates shall be determined by ASTM Standard C 136.

TABLE I

| Sieve Designation | Percentage by Weight Passing Square Mesh Sieves | |
|-------------------|---|--------|
| | Gradation Designations | |
| | No. 1 | No. 2 |
| 3/4" | 100 | -- |
| 1/2" | 90-100 | -- |
| 3/8" | 40-70 | 100 |
| No. 4 | 0-15 | 85-100 |
| No. 8 | 0-5 | 10-40 |
| No. 16 | --- | 0-10 |

c. Bituminous Materials. - Bituminous materials used for the prime coat and the bituminous surface treatment shall conform to the following:

(1) Rapid-curing cutback asphalt for bituminous surface treatments shall conform to the requirements of Federal Specification SS-A-671, grade RC-4 or RC-5. In addition to the requirements of the Federal Specification, the residue from distillation to 680 degrees F. shall show a negative spot when tested in accordance with AASHO Standard T102, using the standard naptha specified therein.

(2) Medium curing cutback asphalt for prime coat shall conform to the requirements of Federal Specification SS-A-671, grade MC-0 or MC-1. In addition to the requirements of the Federal Specification, the residue from distillation to 680 degrees F. shall show a negative spot when tested in accordance with AASHO Standard T102, using the standard naptha specified therein.

16-05. SAMPLING AND TESTING. - a. Samples. - Samples shall be furnished by the contractor at no expense to the Government. Sampling shall be in accordance with ASTM Standard D75 for aggregates and ASTM Standard D 140 for bituminous material, unless otherwise directed. Suitably sized samples of aggregates and bituminous materials shall be submitted to the Contracting Officer for approval not less than 15 days before starting the work. Additional samples of materials shall be furnished by the contractor during construction, as required. Sampling of materials will be observed and supervised by the Contracting Officer when deemed necessary.

b. Tests. - Tests will be performed by the Government at no cost to the contractor.

(1) Stripping Test. - A test sample consisting of the aggregate and bitumen to be used in the surface treatment will be mixed at the temperature specified herein. The sample will then be spread in a loose, thin layer and allowed to air-season for 24 hours before testing. A portion of the sample not over one-half the capacity of the jar, will be placed in a glass jar and completely covered with distilled water. The jar will be fitted with a tight screw cap and allowed to stand for a period of 25 hours. The jar will be vigorously shaken for a period of 15 minutes, and the sample of the mixture will then be examined for stripping. If stripping occurs, the aggregate will be rejected, or an approved method of treating the bituminous materials will be used to prevent it. No method will be used that is of such nature as to cause bituminous material to fail to meet the specifications.

(2) Wear Test. - All aggregates will have a percentage of wear not exceeding 40 percent after 500 revolutions, as determined in accordance with ASTM Standard C 131.

16-06. QUANTITIES OF MATERIALS PER SQUARE YARD. - a. Bituminous material for the prime coat shall be applied at the approximate rate of 0.40 gallon per square yard of shoulder surface or base course, as applicable. The exact quantity may be varied to suit field conditions.

b. The bituminous material and aggregate for the bituminous surface treatments shall be spread in the quantities as shown in Table II. The individual quantities of bituminous material and aggregate may be varied to meet specific field conditions at any time during progress of the work, as directed, without adjustments to contract price.

TABLE II

| | Bituminous material, gallons per square yard, first application | Aggregate pounds per square yard, first spreading | Bituminous material, gallons per square yard, second application | Aggregate, pounds per square yard, second spreading |
|---------|---|---|--|---|
| Grading | | | | |
| No. 1 | 0.25-0.35 | 35-45 | --- | --- |
| No. 2 | -- | -- | 0.20-0.30 | 15-25 |

16-07. EQUIPMENT, TOOLS, AND MACHINES. - Equipment, tools, and machines used in the performance of the work shall be subject to approval and shall be maintained in a satisfactory working condition at all times.

a. Bituminous Distributors. - Bituminous distributors shall have pneumatic tires of such width and number that the load produced on the base surface will not exceed 650 pounds per inch of tire width. The distributor shall be designed and equipped to distribute the bituminous material uniformly at even heat on variable widths of surface at readily determined and controlled rates ranging from 0.50 to 2.0 gallons per square yard, with a pressure range of from 25 to 75 pounds per square inch. The allowable variation from any specified rate shall not exceed 5 percent. The distributor equipment shall include a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gages, volume-measuring devices, a thermometer for reading the temperature of tank contents, and a hose attachment suitable for applying bituminous material to inaccessible areas and patches. The distributor shall be equipped for circulation and agitation of the bituminous material during the heating process.

b. Heating Equipment for Storage Tanks. - Heating equipment for storage tanks shall consist of steam coils and equipment for producing steam, so designed that steam will not be introduced into the material. An armored thermometer with a range from 100 degrees F. to 400 degrees F. shall be affixed to the tank so that the temperature of the bituminous material may be determined at all times.

c. Power Rollers. - Power rollers shall be steel-wheel or pneumatic-tired type conforming to the following requirements:

(1) Steel-wheel rollers shall be of either tandem or three-wheel construction weighing not less than 5 tons and shall be suitable for rolling bituminous pavements. The wheels of the rollers shall be equipped with adjustable scrapers. The rollers shall be equipped with water tanks and sprinkling apparatus to be used when necessary to keep the wheels wet to prevent adherence of the bituminous material to the wheels.

(2) Pneumatic-tired rollers shall be self-propelled and equipped with not less than nine wheels mounted on two axles in such manner that the rear tires will not follow in the tracks of the forward group. The pneumatic-tired roller shall also be equipped with suitable boxes or platforms for ballast loading and shall be loaded as directed. The tires shall be uniformly inflated to not less than 45 pounds per square inch pressure.

d. Mechanical Spreaders. - Mechanical spreaders shall be adjustable and capable of spreading aggregate at controlled amounts per square yard as specified.

e. Broom Drags. - Broom drags shall consist of brooms of an approved type, mounted in a frame and in such a manner as to spread the aggregate uniformly over the surface of the area to be treated. The drags shall be equipped with tow plates for towing. Towing equipment shall be pneumatic-tired.

f. Brooms and Blowers. - Brooms and blowers shall be of the power type, suitable for effectively cleaning the surfaces to be treated.

16-08. WEATHER LIMITATIONS. - The prime coat and the bituminous surface treatments shall be applied only when the gravel shoulders or base course or primed gravel base course or shoulders, as applicable, is dry or contains moisture not in excess of that which will permit uniform distribution and the desired penetration. It shall not be applied when the atmospheric temperature in the shade is below 50 degrees F., unless otherwise directed.

16-09. CONDITIONING BASE COURSES AND SHOULDERS. - The surfaces of the base courses and shoulders will be inspected and tested for tolerances by the Contracting Officer. Any deviation in excess of the required tolerances shall be corrected as directed. Any ruts or soft, yielding spots that may appear in the base course or shoulder shall be corrected by loosening, removing unsuitable material, adding suitable material, reshaping, and recompacting to line and grade, as directed.

16-10. PREPARATION OF SURFACE. - Immediately before applying the prime coat and the first application of bituminous material for surface treatment, the base course or shoulder surface course or primed surface,

as applicable, shall be cleaned of loose material with power sweepers, power blowers, or hand brooms, as directed. Care shall be taken to remove all dirt, clay, and other loose or foreign matter. After the cleaning operation has been completed, and prior to the prime coat and the first application of bituminous material for surface treatment, the area to be treated will be inspected by the Contracting Officer to determine its fitness for receiving the prime coat and the first application of bituminous material.

16-11. APPLICATION OF PRIME COAT. - Immediately following the preparation of the gravel base course or shoulder, as applicable, the bituminous prime coat material shall be applied by means of a bituminous distributor at the temperature designated by the Contracting Officer, within the range of 50 to 120 degrees F. for MC-0 and 80 to 125 degrees F. for MC-1. The bituminous material shall be applied at the pressure and in the amounts as directed by the Contracting Officer. The priming material shall be so applied that uniform distribution is obtained at all points of the surface to be primed. Unless the distributor is equipped so as to obtain satisfactory results at the junction of the previous and subsequent applications, building paper shall be spread on the surface for a sufficient distance back from the ends of each application so that flow through the sprays may be started and stopped on the paper, and that all sprays will be operating at full force on the surface to be treated. Immediately after the application, the building paper shall be removed and destroyed. All spots unavoidably missed by the distributor shall be properly treated with bituminous material. Following the application of prime material, the surface shall be allowed to dry for a period of not less than 48 hours without being disturbed, or for such additional period of time as may be necessary to attain penetration into the foundation course and drying out or evaporation of the volatiles from the prime material, which period shall be determined by the Contracting Officer. The contractor shall furnish and spread sufficient approved sand on all areas which show an excess of bituminous material to effectively blot up and cure the excess as directed. The primed surface shall be maintained by the contractor until the first application of surface treatment or binder course is placed. During the interval, the contractor shall protect the primed surface against damage and shall repair all broken spots. No smoking, fires or flames other than the heaters that are a part of the equipment shall be permitted within 25 feet of heating, distributing or transferring operations of bituminous materials.

16-12. FIRST APPLICATION OF BITUMINOUS MATERIAL. - First application of bituminous material for surface treatment shall be applied by means of a bituminous distributor at the temperature designated by the Contracting Officer, within the range of 180 to 225 degrees F. for RC-4 and 215-285 degrees F. for RC-5. The bituminous material shall be applied in the amounts within the limits specified in Paragraph: QUANTITIES OF

MATERIAL PER SQUARE YARD, as determined by the Contracting Officer. The bituminous material shall be so applied that uniform distribution is obtained over all points of the surface to be treated. Unless the distributor is equipped to obtain satisfactory results at the junction of previous and subsequent applications, building paper shall be spread on the surface for a sufficient distance back from the ends of each application so that flow through the sprays may be started and stopped on the paper in order that all sprays will be operating at full force on the surface to be treated. Immediately after the application, the building paper shall be removed and destroyed. All areas inaccessible to the distributor shall be properly treated with bituminous material. No smoking, fires, or flames other than the heaters that are a part of the equipment shall be permitted within 25 feet of heating, distributing, or transferring operations of bituminous materials other than bituminous emulsions. If tar is used, a full-face, organic, vapor-type respirator and protective creams shall be used by personnel exposed to fumes. Protective creams shall not be used as a substitute for cover clothing.

16-13. FIRST SPREADING OF AGGREGATE. - Immediately following the first application of bituminous material for surface treatment, the coarser aggregate shall be spread uniformly over the surface in amounts within the limits specified in paragraph: QUANTITIES OF MATERIAL PER SQUARE YARD. Spreading shall be done with mechanical spreaders. The aggregate shall be spread evenly by hand on all areas missed by the mechanical spreader. Equipment spreading aggregate shall be operated backwards so that the bituminous material will be covered ahead of the truck wheels. When hand spreading is employed on inaccessible areas, aggregate shall be spread directly from trucks. Additional aggregate over areas having insufficient cover shall be spread by hand and shall be continued during the operations whenever necessary.

16-14. BROOMING AND ROLLING FIRST COURSE. - The surface shall be rolled after sufficient aggregate is spread, and rolling shall continue until no more aggregate can be worked into the treated surface. The rolling of the course shall be accompanied by the use of a self-propelled pneumatic-tired roller or a tandem or three-wheel power roller. If rolling the course with a tandem or a three-wheel power roller excessively crushes and shatters the aggregate, the roller shall be removed from the course, and any additional rolling required shall be accomplished with a self-propelled pneumatic-tired roller as directed. The surface shall be broom dragged as soon as possible after the first coverage by the roller, but not until the surface has set sufficiently to prevent excessive marking. Broom dragging shall continue until the aggregate is uniformly distributed over the surface. Broom dragging, rolling, and supplemental spreading of aggregate shall continue until the surface is cured and rolled sufficiently to key and set the aggregate, as approved. In all places not accessible to the rollers, the aggregate shall be adequately compacted with pneumatic tampers. Any aggregate that becomes coated or

or mixed with dirt or any other foreign matter shall be removed, replaced with clean aggregate, and rerolled, as directed. All surplus aggregate shall be swept off the surface and removed prior to the second application of bituminous material. The contractor shall maintain and protect the treated areas by barricades, if so directed, until the second application of bituminous material is applied.

16-15. SECOND APPLICATION OF BITUMINOUS MATERIAL. - Second application of bituminous material shall follow within 24 hours after the construction of the first course, weather permitting, unless the treated surface is excessively moistened by rain, when it shall be allowed to dry, for such time as is deemed necessary by the Contracting Officer. The second application of bituminous material shall be applied in the manner including the safety precautions specified in paragraph: FIRST APPLICATION OF BITUMINOUS MATERIAL at the temperature as directed by the Contracting Officer, within the range of 180 to 255 degrees F. for RC-4 and 215-285 degrees F. for RC-5. The bituminous material shall be applied in the amounts within the limits specified in paragraph FIRST APPLICATION OF BITUMINOUS MATERIAL at the temperature as directed by the Contracting Officer, within the range of 180 to 255 degrees F. for RC-4 and 215-285 degrees F. for RC-5. The bituminous material shall be applied in the amounts within the limits specified in paragraph: QUANTITIES OF MATERIALS PER SQUARE YARD, as directed.

16-16. SECOND SPREADING OF AGGREGATE. - Immediately following the second application of bitumen, the finer mineral aggregate conforming to the grading specified in Paragraph: MATERIALS, shall be spread uniformly over the bituminous material in the amounts within the limits specified in paragraph: QUANTITIES OF MATERIAL PER SQUARE YARD, as directed. The aggregate shall be spread and processed in the manner specified for the first course.

16-17. BROOMING AND ROLLING SECOND COURSE. - The surface shall be rolled and broom dragged in the manner specified for the first course until a thoroughly bonded, smooth, even textured surface is produced. All surplus aggregate shall be swept off the surface and removed prior to final acceptance.

16-18. WAYBILLS AND DELIVERY TICKETS. - Copies of waybills and delivery tickets shall be submitted during the progress of the work. Before the final statement is allowed, the contractor shall file with the Contracting Officer certified waybills and delivery tickets for all the bituminous materials used in the prime coat and the bituminous surface treatments. The contractor shall not remove bituminous materials from the tank cars or storage tanks until the initial outage and temperature measurements have been taken by the Contracting Officer, nor shall the cars or tanks be released until the final outages have been taken by the Contracting Officer.

16-19. MEASUREMENT. - The quantity of double bituminous surface treatment to be paid for will be the number of square yards of surface acceptably treated in accordance with the requirements hereinbefore

specified and within the limits indicated on the drawings. No measurement or separate payment will be made for prime coat.

16-20. PAYMENT. - Payment for the double bituminous surface treatment will be made at the contract unit price per square yard for Item 46, "Bituminous Surface Treatment", which price shall include all costs in connection with furnishing and placing all materials including prime coat required under this section of the specifications. All costs for furnishing and placing bituminous prime coat in areas to receive bituminous concrete pavement shall be included in the applicable contract unit prices for Items, "Bituminous Concrete Pavement".

SECTION 17

TOPSOILING, SEEDING, AND MULCHING (Items 49, 50, and 53)

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SECTION 17

TOPSOILING, SEEDING, AND MULCHING (Items 49, 50, and 53)

17-01. SCOPE. - This section covers topsoiling, seeding, mulching, and maintenance and establishment of grass.

17-02. DEFINITIONS. - a. Topsoil. - Earth material consisting of the upper layer or layers of productive soil and humus shall be salvaged for reuse as a medium for the production of grass cover. Such earth material is defined as topsoil. Peat, muck, and silt, excavated from swamp and bog areas shall not be considered topsoil and shall be salvaged and reused for topsoiling purposes only when and as directed by the Contracting Officer.

b. Depth of Topsoil Salvage. - The contractor shall strip salvage and stockpile topsoil for reuse in topsoiling, in a manner and to a depth which shall insure conservation and reuse of the best topsoil available from areas to be graded and excavated. Incorporation of underlying material undesirable for use in topsoiling shall be avoided. Stripping for structural purposes shall be accomplished to depths and as required by other sections of these specifications.

c. Segregation of Topsoil Types. - Topsoil shall be segregated from all other earth or rock materials, but segregation of topsoil of different types or from different areas shall not be required. However, topsoil used in construction and repair of lawn areas where lawn seed as defined in this section of the specifications is used, shall be selected from the best topsoil available in the stockpiles.

d. Class A Seedbed. - A Class A seedbed is a seedbed constructed by properly preparing the subgrade as required by Paragraph PREPARATION OF SUBGRADE of this section of the specifications, applying topsoil to the depth indicated on the drawings, or if not so indicated, to a depth of not less than four (4) inches, and grading to required limits.

e. Class B Seedbed. - A Class B seedbed is a seedbed constructed by properly preparing, in accordance with paragraph PREPARATION OF SEEDBED of this section of the specifications, the soil surface in place after other operations have been completed. No topsoiling is required unless topsoiling is a part of another operation, or unless the area is used for disposal of excess topsoil.

17-03. TREATMENT OF AREAS TO BE TOPSOILED AND/OR SEEDED. - a. The following areas shall be topsoiled (Class A Seedbed) and seeded, using Class A seed:

(1) Areas as indicated on the drawings to be topsoiled and seeded, except where treatment falls under Subparagraph b below.

(2) Areas not indicated on the drawings but which fall within the meaning of GC-9. These areas shall be treated at no additional cost to the Government.

(3) Areas disturbed by the contractor including areas falling outside the limit of work line, areas within the limit of work line where no work is indicated on the drawings, and areas used for the convenience of the contractor including haul roads, storage areas, access roads, field office sites, parking areas, stockpile areas and areas of similar use, unless specifically exempted in writing by the Contracting Officer. These areas shall be treated at no additional cost to the Government.

(4) The provisions of Subparagraphs 17-03a(1), (2), and (3), above, do not exempt the contractor from responsibility for vegetation other than grass, such as trees and shrubs, in accordance with GC-9 of these specifications.

(5) Earth slopes and disturbed areas near or adjacent to the Spillway Approach Channel, the Spillway Discharge Channel, and the Outlet Channel of the dam Outlet Works.

(6) Earth Slopes and disturbed areas along the relocated, improved, raised and new roads, except that lawn areas shall be treated as specified in Paragraph 17-03b(1), of this section of the specifications. Areas inside the turnaround on Waterworks road and the turnaround on East Hill Road are included.

(7) Earth slopes and disturbed areas on, near and adjacent to the Munn Road - Sutcliffe Road Dike.

(8) Earth slopes and disturbed areas near, adjacent to or contained in diversion ditches, drainageways, and similar drainage control facilities.

(9) Areas disturbed by the relocation of water line and the installation of underground drainage conduits, inlets, manholes, and similar facilities.

b. The following areas shall be topsoiled (Class A Seedbed) and seeded, using Class B (lawn) seed.

(1) Areas graded, excavated or disturbed by construction of the road relocation, road improvements or by road raising, which are

near or adjacent to existing houses, buildings, drives or walks and which prior to construction operations were lawn type areas or areas maintained as lawns.

c. Borrow areas shall be treated in accordance with the applicable provisions of the EXCAVATION section of the specifications, and shall be fertilized, spray seeded, mulched and maintained as required by this section of the specifications.

d. Spoil areas and waste areas shall be seeded using a Class B seedbed and Class A seed. The contractor shall be responsible for managing the spoil operation in such a manner that boulders, large stones, stumps, roots, trees and similar material shall be covered with earth material, and shall not remain exposed on the surface or side slopes of the spoil and waste areas. The contractor shall also be responsible for providing an earth cover over the surface and side slopes of spoil areas of at least 4 inches. Surplus topsoil may be used for this purpose, but only when all other requirements for topsoil have been fulfilled.

17-04. MATERIALS. - a. Topsoil. - Topsoil shall be salvaged from areas within the limit of work in which excavation or grading is required, and below elevation 693 upstream of the dam. All other topsoil necessary to complete the work shall be furnished by the contractor from approved sources off the site at no additional cost to the Government. Topsoil to be provided by the contractor shall be natural fertile friable surface soil possessing the characteristics of representative soils in the vicinity that produce heavy growths of crops, grass, or other vegetation and shall be obtained from naturally well-drained areas. The topsoil shall be reasonably free from subsoil, clay lumps, brush, objectionable weeds and other litter. The topsoil shall be free from objects larger than 2 inches in any dimension, including stones, stumps, roots and debris, and shall not contain toxic substances or any other material or substance which might be harmful to plant growth or be a hindrance to grading, planting or maintenance operations. Delivery of off-site topsoil shall not begin prior to written approval from the Contracting Officer.

b. Fertilizer. - Fertilizer shall be a complete, 10-6-4 grade, uniform in composition, free flowing and suitable for application with approved equipment, delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State Fertilizer laws, and bearing the name, trade name or trade mark, and warranty of the producer.

c. Lime. - Lime shall be ground limestone containing not less than 85 percent of total carbonates and shall be ground to such fineness that at least 50 percent will pass through a 100-mesh sieve and at least 90 percent will pass through a 20-mesh sieve. Coarser materials will be acceptable provided the specified rates of application are increased.

proportionately, on the basis of quantities passing the 100-mesh sieve, but no additional payment will be made for the increased quantity.

d. Seed. - All seed used shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of Invitation for Bids. All seed shall be furnished in sealed standard containers, unless exception is granted in writing by the Contracting Officer. Seed which has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable. The analysis of seed in each lot of mixture shall be as follows:

| <u>Kind of Seed</u> | <u>% by Wt. In Mixture</u> | <u>Min. % Purity</u> | <u>Min. % Germ.</u> |
|--|--------------------------------|--------------------------|-------------------------|
| (Botanical Name (Common Name) | | | |
| <u>CLASS A SEED</u> (Erosion Control) | | | |
| Agrostis tenuis hv. Highland Bentgrass | 5 | 98 | 85 |
| Bromus inermis Smooth Brome | 10 | 85 | 90 |
| Festuca elatior arundinaceae Alta Fescue | 30 | 98 | 85 |
| Festuca rubra Red Fescue | 35 | 98 | 85 |
| Poa Compressa Canada Bluegrass | 15 | 80 | 75 |
| Trifolium repens White Clover (New York Wild Strain) | 5 | 98 | 85 |
| <u>CLASS B SEED</u> (Lawn Seed) | | | |
| Agrostis tenuis hv. Highland Bentgrass | 10 | 98 | 85 |
| Festuca rubra Red Fescue | 35 | 98 | 85 |
| Festuca rubra commutata Chewings Fescue | 35 | 98 | 85 |
| Poa Pratensis Kentucky Bluegrass | 15 | 80 | 75 |
| Trifolium repens White Clover (New York Wild Strain) | 5 | 98 | 85 |

NOTE: Weed Seed for both Class A and Class B not to exceed 1.0% of total mixture.

e. Mulch. - To be used on all seeded areas.

(1) General. - Acceptable mulch shall be any of the following materials, or other approved locally available material. Mulch material which contains an excessive quantity of mature seed of noxious weeds or other species which would grow and be detrimental to the desired turf, or provide a menace to surrounding farm land will not be acceptable. Straw or other mulch material that is fresh or excessively brittle, or that is in such an advanced stage of decomposition as to smother or retard growth of grass, will not be acceptable.

(a) Straw shall consist of the threshed stalks of oats, wheat, barley, rye, rice, flax, beans, peas or peanuts.

(b) Hay shall be cured, dried and shall be made up of native grasses, marsh or beach grasses or sedges.

f. Jute Erosion-Control Matting. - The matting shall be a cloth of a uniform open plain weave of undyed and unbleached single jute yarn. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than one-half its normal diameter. Jute matting shall be furnished in new and unused rolled strips as follows: 78 warp ends per width, 41 weft ends per yard. A tolerance of plus or minus 5 percent in weight is allowable. In addition, matting and staples shall be as follows:

(1) Minimum Width: 42 inches
Weight: 1.4 lbs. per sq. yard.

(2) Staples for the matting shall be made from No. 8 steel wire bent U-shaped. The U shall be 1-1/2 to 2 inches in width and the overall length of staple shall be 10 inches. This type staple is for use mainly in cohesive and stable soils.

17-05. INSPECTION AND TESTS. - a. Topsoil. - At least 30 days prior to the intended delivery of off-site topsoil, the contractor shall notify the Contracting Officer of the sources from which topsoil is to be furnished. The topsoil proposed for use will be inspected by the Contracting Officer to determine whether the selected soil or soils meet the requirements. At the time of inspection, the Contracting Officer will require representative soil samples to be taken from several locations on the area(s) under consideration, to be tested for physical properties and PH (or lime requirements), for organic matter, and for available nitrogen, phosphoric acid and potash. Samples shall be supplied by the contractor at no additional cost to the Government, and tests will be made under the supervision of the Contracting Officer without cost to the contractor. Sampling and testing will be in accordance with standard practices of soil testing. Topsoil shall be approved prior to use. Topsoil from off-site sources shall be required to contain not less than 5% nor more than

20% organic matter as determined by loss on ignition of the oven-dried samples, and shall contain a concentration of nutrients equal to that in any Government-furnished topsoil. If, after the testing of the samples, the topsoil is found to be not in accordance with these specifications, the Contracting Officer may require as a requisite for acceptance, that the contractor, without additional compensation, add humus as directed, to the topsoil proposed for use, in order to make the material acceptable, and that he add fertilizer as directed in addition to the quantity specified, to raise the concentration of nutrients to a level equal to that in the Government-furnished topsoil, after fertilization. The depth to which topsoil is to be stripped shall be as approved, and samples drawn from the area shall be taken from the full stripping depth approved.

b. Fertilizer and Lime. - The Contracting Officer shall be furnished with duplicate copies of invoices for all fertilizer and lime used on the project. Invoices for fertilizer shall show the grade furnished. Invoices for lime shall show total minimum carbonates and minimum percentages of the material furnished that pass the 100- and the 200- mesh sieves. Each lot of fertilizer and lime shall be subject to sampling and testing at the discretion of the Contracting Officer. Sampling and testing will be in accordance with the official methods of the Association of Official Agricultural Chemists. Upon completion of the project, a final check of the total quantities of fertilizer and lime used will be made against the total area seeded, and, if the minimum rates of application have not been met, the Contracting Officer may require the distribution of additional quantities of these materials to make up the minimum application specified.

c. Seed. - The Contracting Officer shall be furnished with duplicate signed copies of a statement from the seed vendor, certifying that each container of seed delivered is fully labeled in accordance with the Federal Seed Act and is at least equal to the specification requirements for seed in the MATERIALS paragraph of this section of the specifications, as furnished with the purchase order. This certification shall appear on, or with, all copies of invoices for the seed. Each lot of seed shall be subject to sampling and testing at the discretion of the Contracting Officer. Sampling and testing will be in accordance with the latest Rules and Regulations under the Federal Seed Act.

d. Mulch. - No less than 30 days prior to commencement of mulching operations, the contractor shall notify the Contracting Officer of the sources from which the mulch materials are to be secured and the quantities thereof, and representative samples of the materials proposed to be used shall be furnished for approval.

e. Jute Erosion-Control Matting. - A representative sample of the jute matting consisting of not less than one square yard shall be furnished for approval.

f. Nomenclature. - The scientific and common names of seed materials specified herein conform with the latest approved names listed in "Standardized Plant Names" (1942 Edition) prepared by the American Joint Committee on Horticultural Nomenclature. Variety names not included therein are in conformance with names adopted by the U. S. Department of Agriculture and generally accepted in the seed trade.

17-06. PREPARATION OF SUBGRADE. - a. General. - Equipment necessary for the proper preparation of the ground surface and for handling and placing all materials required shall be on hand, in good condition, and shall be approved by the Contracting Officer before the work is started.

b. Clearing of Subgrade. - Prior to grading and tillage operations, all vegetation on the site sufficient to interfere with grading or tillage operations shall be mowed, grubbed, raked, and burned or removed from the site, or, when suitable, it shall be used for mulch as directed by the Contracting Officer. Prior to or during grading and tillage operations, the ground surface shall be cleared of all stumps, stones larger than 2 inches in diameter, roots, cable, wire, grade stakes, and any other materials which might hinder proper grading, tillage, or subsequent maintenance operations.

c. Grading of Subgrade. - Grades on the areas to be topsoiled which have been established by others, as shown on the drawings, shall be maintained in a true and even condition. Maintenance shall include necessary repairs to previously graded areas. Where the grades have not been established, the areas shall be graded to finish grade elevations less the depth of topsoil to be applied, as shown on the drawings, and all surfaces shall be left at the prescribed grades in an even and properly compacted condition so as to prevent the formation of depressions where water will stand. The subgrade elevation at any point shall not vary more than plus or minus one tenth foot from finish grade elevations less the depth of topsoil, as shown on the drawings. Swales, ditches, slopes and level areas shall be accurately graded to required subgrade elevations.

d. Tillage of Subgrade. - After the areas required to be topsoiled have been brought to the proper subgrade parallel to the finished grades shown on the drawings, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by disking, or by scarifying to a depth of at least 2 inches, to permit bonding of the topsoil to the subgrade. On banks and inclines, the subgrade finish shall be loosened by harrowing in rows parallel to the contours of the slope. All other equipment to be employed on such slopes shall be operated similarly.

e. Approval of Subgrade. - There shall be no application of topsoil made without the prior approval of the finished subgrade by the Contracting Officer.

17-07. OBTAINING TOPSOIL. - After inspection and approval by the Contracting Officer of the source(s) of topsoil, and prior to stripping, rank growths of vegetation, stones, or debris on the surface which might interfere with grading or later tillage operations shall be removed. Sod or other cover that cannot be disked or otherwise incorporated into the topsoil before or after delivery, in such manner that it can be spread properly, shall be removed. Where topsoil is to be made available on areas to be graded, the topsoil shall be removed to the required depth from the designated areas prior to the beginning of grading operations. The topsoil removed from areas to be stripped or areas to be graded, or obtained from designated Government stockpiles, shall be kept separate from other excavated material. When topsoil is to be stripped and salvaged from wooded areas, or from areas where boulders, large stones or similar materials are present, clearing and grubbing shall be accomplished in accordance with the requirements of Section 1, PREPARATION OF SITE. Immediately following the clearing and grubbing operation, roots, stones, stumps and similar material shall be removed from the soil to the depth of topsoil salvaged by means of a bulldozer (crawler tractor) equipped with a root-raking or land-clearing rake or blade (Drott 95-inch width to 151-inch width or equal on I.H. TD-9 to TD-25 or equal) and by a tractor-drawn stone rake. Topsoil from a wooded area shall not be salvaged, stockpiled or reused until it has been demonstrated to the Contracting Officer that removal of stones, stumps and other materials having a dimension of 2 inches or over has been accomplished. All topsoil, regardless of the source, shall be transported and placed by the contractor. When topsoil is stockpiled for later use, the stockpiles shall be maintained free of weeds. Weed growth shall be prevented by the application of a suitable herbicide or by frequent cutting or pulling of plants.

17-08. PLACING TOPSOIL. - The topsoil shall be uniformly distributed on the designated areas and evenly spread, and in sufficient depth to compensate for any shrinkage, so that the thickness of the compacted topsoil shall be as indicated on the drawings; or when not so indicated to a minimum depth of four (4) inches. The topsoil depth shall be measured perpendicular to the plane of the finished grade. The spreading shall be performed in such a manner that fine grading, fertilizing, liming and seeding can proceed with little additional soil preparation or tillage. Irregularities in the surface resulting from operations thereon shall be corrected to prevent the formation of depressions where water will stand. Topsoil shall not be placed or worked when it or the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to the proposed seeding or to proper grading. Topsoiling shall be performed only when it can be followed within a reasonable time by seeding. If excess topsoil remains after all requirements have been met, such excess shall be spread over the spoil areas, unless all or part of such excess is directed by the Contracting Officer to be left stockpiled.

17-09. PREPARATION OF SEEDBED. - a. General. - It shall be demonstrated to the Contracting Officer before starting work that the application of fertilizers, lime, and seed required will be made uniformly and at the specified rates.

b. Fine Grading. - The seedbed shall be brought to the required finished grades, free from unsightly variations, lumps, ridges, and depressions, through successive stages of light rolling, fine grading, and hand and machine raking operations. Grades and elevations shall be properly set and marked by means of stakes, string lines, spot elevations and similar means when necessary or when required by the Contracting Officer. Rolling shall be accomplished with a roller weighing approximately 75-pounds per foot of width. During such operations and prior to seeding, the surface shall be cleared by whatever means are necessary including hand raking of all stones, stumps, or other objects larger than 1 inch in thickness or diameter in areas designated in Paragraph 17-03b(1), and larger than 2 inches in thickness or diameter in all other seeded areas except borrow areas. All roots, brush, wire, grade stakes, and other objects that may be a hindrance to maintenance operations shall be removed from all seedbeds. Finely pulverized seedbeds shall be formed. The elevation of the seedbed surface at any point shall match exactly the elevation at adjacent pavement edges, curbs, manhole rims and finish grade elevation lines at structures, and overlot shall not vary more than plus or minus one tenth of a foot (.10 foot) from the elevations shown on the drawings or interpolated from the contours, sections, or details, except in spoil areas, where variations in the smoothness of the finished surface up to .30 ft. (three tenths of a foot) will be acceptable.

c. Application of Fertilizer and Lime. - Fertilizer and lime shall be distributed uniformly over the areas specified to be topsoiled and seeded, in accordance with the following schedule:

| <u>Material</u> | <u>Rate in Pounds</u> | |
|-----------------|-----------------------|-----------------|
| | <u>Per 1,000 S.F.</u> | <u>Per Acre</u> |
| Fertilizer | 25 | 1,000 |
| Lime | 100 | 2 Tons |

Each material shall be incorporated independently into the top 3 inches of soil by disking, harrowing, drill, or other methods acceptable to the Contracting Officer during fine grading operations. Distribution of fertilizer and seed may be accomplished simultaneously by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time at the appropriate stage for seeding operations.

d. Leveling. - Any undulations or irregularities in the surface resulting from tillage, fertilizing, liming, or other operations shall be leveled out before seeding operations are begun. No seeding shall be done until the prepared seedbed has been approved by the Contracting Officer.

17-10. PLANTING SEED. - a. General. - All seeding work shall be done between the dates of 15 April and 1 June or between 15 August and 15 September except as otherwise directed in writing by the Contracting Officer.

A method of sowing satisfactory to the Contracting Officer shall be employed, making use of approved mechanical power-drawn drills or seeders or mechanical hand-seeders. Regardless of the type of sowing equipment used, the seedbed shall be pulverized to a depth of three inches before seed is applied. When drills are used, provisions shall be made by markers or other means to assure that the successive seeded strips will overlap or be separated by a space no greater than the space between the rows planted by the equipment being used. When delays in operations carry the work beyond the most favorable planting season for the species designated, or when conditions are such, by reason of drought, high winds, excessive moisture, or other factors, that satisfactory results are not likely to be obtained, the Contracting Officer will stop the work, and work shall be resumed only when directed. If inspection, during seeding operations or after there is a show of green, indicates that strips wider than the space between the rows planted have been left, or other areas skipped or too sparsely seeded, the Contracting Officer may require corrective work and the sowing of additional seed on such areas. When the equipment used leaves wheel marks, tire marks, or ruts in the seedbed, such marks and ruts shall be removed by hand raking or the addition of topsoil and seeded.

b. Rates. - Seed shall be sown at the minimum rate of 3 pounds per 1,000 square feet.

c. Broadcast Seeding. - Seed shall be broadcast by approved sowing equipment. The seed shall be uniformly distributed over the designated areas. Half the seed shall be sown with the sower moving in one direction, and the remainder shall be sown with the sower moving at right angles to the first sowing. The seed shall be covered to an average depth of 1/4 inch by means of a brush harrow, chain harrow, cultipacker, or other approved device. Broadcast seeding shall not be done during windy weather.

d. Drill Seeding. - Drill seeding shall be done with approved equipment with drills not more than 2 inches apart. The seed shall be sown uniformly over the designated areas, and covered to an average depth of 1/4-inch concurrently with the sowing.

e. Floss Spraying. - The application of fertilizer and seed to slopes of 1 on 3 or steeper, in the Borrow Area, and on the slopes of the Sutcliffe Road, Munn Road, Dike and approaches, the seedbeds having been prepared in accordance with the provisions of this section of the specifications, may be accomplished in one operation by the use of an approved spraying machine. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water. The spraying equipment shall be so designed that when the solution is sprayed over an area resulting deposits of fertilizer and seed shall be equal in quantity to those quantities specified herein. In no case shall lime be sprayed simultaneously with fertilizer and seed, nor shall any materials be used that have been standing in solution for a

period exceeding 8 hours. After the spraying has been accomplished, the surface of the loam shall be compacted by rolling as specified below. If the results of the spraying operations are unsatisfactory, the contractor will be required to abandon this method and to apply the materials as described hereinbefore. If the floss spraying method is used, the requirement for pulverizing the seedbed shall be met, in accordance with Paragraph 17-10 of this section of the specifications. However, the requirements for covering the seed after application to a depth of 1/4 inch as stated in Subparagraphs 17-10c and d of this section of the specifications and the requirements for incorporating fertilizer into the top 3 inches of soil as stated in Paragraph 17-09c of this section of the specifications will be waived.

17-11. COMPACTING. - Immediately after the operations specified above have been completed, the entire area shall be compacted by means of a cultipacker, roller, or other approved equipment weighing 60 to 90 pounds per linear foot of roller. If the soil is of such type that a smooth or corrugated roller cannot be operated satisfactorily, a pneumatic roller (not wobble-wheel) will be required. The pneumatic roller shall have tires of sufficient size so that complete coverage of the soil surface is obtained. When a cultipacker or similar equipment is used, the final rolling shall be at right angles to the existing slopes to prevent water erosion or at right angles to the prevailing wind to prevent dust, as directed by the Contracting Officer.

17-12. APPLYING MULCH. - The mulch shall be spread uniformly on all seeded areas in continuous blanket, as follows: Straw or hay at the rate of 2 tons per acre. If the mulching material is too long and brittle for proper securing in the surface soil, it shall be cut by an ensilage cutter or other equipment to lengths of not more than 8 inches and watered as needed before spreading, to assure proper securing of mulch into the soil as specified hereinafter. The mulch shall be spread by hand or by use of a manure spreader, a modified grain combine with straw-spreader attachment, a blower or other suitable approved equipment. Mulching shall be started at the upper part of a slope, and shall continue uniformly until the area is completely covered.

17-13. SECURING MULCH. - Immediately following the spreading of the mulch, the material shall be anchored to the soil by a V-type wheel land-packer, a disk harrow set to cut only slightly, a rotary hoe run backwards, or other suitable approved equipment which will secure the mulch firmly in the ground to form a soil-binding mulch and prevent loss or bunching by wind. The number of passes over the mulch needed to secure it firmly to the soil shall be as determined by the Contracting Officer, but shall in no case exceed three passes. On slopes where machinery cannot be used, mulch shall be retained in place by a shallow covering of earth, by pressing into the soil at 18-inch intervals with a spade or other approved tool, by twine, stakes, or brush, or by other suitable means which will not be detrimental to subsequent maintenance.

17-14. REMOVAL OF MULCH. - Whenever in the opinion of the Contracting Officer the mulch material becomes injurious to the treated area because of decomposition, matting or bunching, or when growth of grass is retarded or maintenance impeded, the contractor shall carefully remove the mulch, transport it, and deposit it in an approved spoil area.

17-14A. INSTALLATION OF JUTE EROSION CONTROL MATTING. - a. Area Where Matting is Required. - Jute matting shall be installed in all areas indicated on the drawings, and in accordance with sketch "Jute Matting, Installation Details" attached at end of this section.

b. Soil Preparation. - After the areas to receive jute matting have been shaped to the grades and cross sections shown on the drawings, they shall be scarified, cleaned up, fertilized, limed, topsoiled and seeded in conformance with the provisions of this section of the specifications, except that:

(1) No rolling or compacting of the soil surface shall be done prior to installing the jute matting. It is essential to have a loose, pulverized soil in which to bed the jute matting.

(2) Only half the seed shall be applied prior to placing the jute matting. The other half shall be applied immediately following placement of the jute matting.

c. Placing Jute Matting. - Jute matting shall be laid flat, parallel to the flow of water. Where more than one strip is required, they shall overlap at least 4 inches. Ends shall overlap at least 6 inches, with the up-grade section on top. The up-slope end of each strip of matting shall be buried in 6-inch deep slots with the soil firmly tamped against it.

Check slots shall be placed between the end of strips by placing a tight fold of the matting at least 6 inches deep vertically in the soil. These shall be tamped and stapled the same as up-slope ends.

The edges of matting shall be similarly buried around the edges of inlets and other structures.

Matting shall be spread evenly, loosely, and smoothly and in contact with the soil at all points. It shall be pressed into the soil with a light lawn roller or by a tamper.

The matting shall be held in place by staples as specified driven vertically into the soil. Staples shall be spaced not more than 3 feet apart in three rows for each strip, with one row along each edge and one row alternately spaced in the center. All ends of the matting and check slots shall have the staples spaced 10 inches apart across their width.

d. Maintenance and Repair. - The contractor shall maintain the jute matted areas until all work on the entire contract has been completed and accepted. Maintenance shall consist of the repair of areas damaged by erosion, wind, fire, or other causes. Such areas shall be repaired to re-establish the condition and grade of the soil prior to application of the matting, and shall be retilled, refertilized, reseeded, and remulched as specified under this section of the specifications.

17-15. PROTECTION. - The topsoiled and seeded areas shall be protected against traffic and other use by erecting barricades or a substantial wire and stake enclosure immediately after seeding and mulching operations have been completed, and by placing warning signs of a type approved by the Contracting Officer on the completed areas. The contractor shall repair any damage resulting from his operations. All mulch material which has been removed from the site by wind or from other causes shall be replaced and secured. Repair work which is required because of the contractor's negligence shall be performed without cost to the Government.

17-16. CLEAN-UP. - The contractor shall leave each area neat and clean, with adjacent turf and tree-covered areas raked of extraneous matter, and with all debris removed from the site. Any paved area over which hauling operations are conducted shall be kept clean and any topsoil, mulch, clippings, or other material which may be brought upon the paved surface shall be removed promptly. Rocks, stumps, trees, limbs, excess earth material and debris of all kinds shall be removed from the seeded areas and their perimeters and spoiled.

17-17. ESTABLISHMENT. - a. General. - The contractor shall be responsible for the proper care including watering of the seeded and mulched areas during the period when the grass is becoming established. This period shall extend for 45 days after the completion of the seeding on the entire project or until final acceptance of all elements of the completed project, whichever period is longer. In the event seeding is completed after 15 September, and final acceptance of all elements of the project except seeding occurs prior to May 15 of the succeeding year, this ESTABLISHMENT period shall extend to May 15 of the succeeding year.

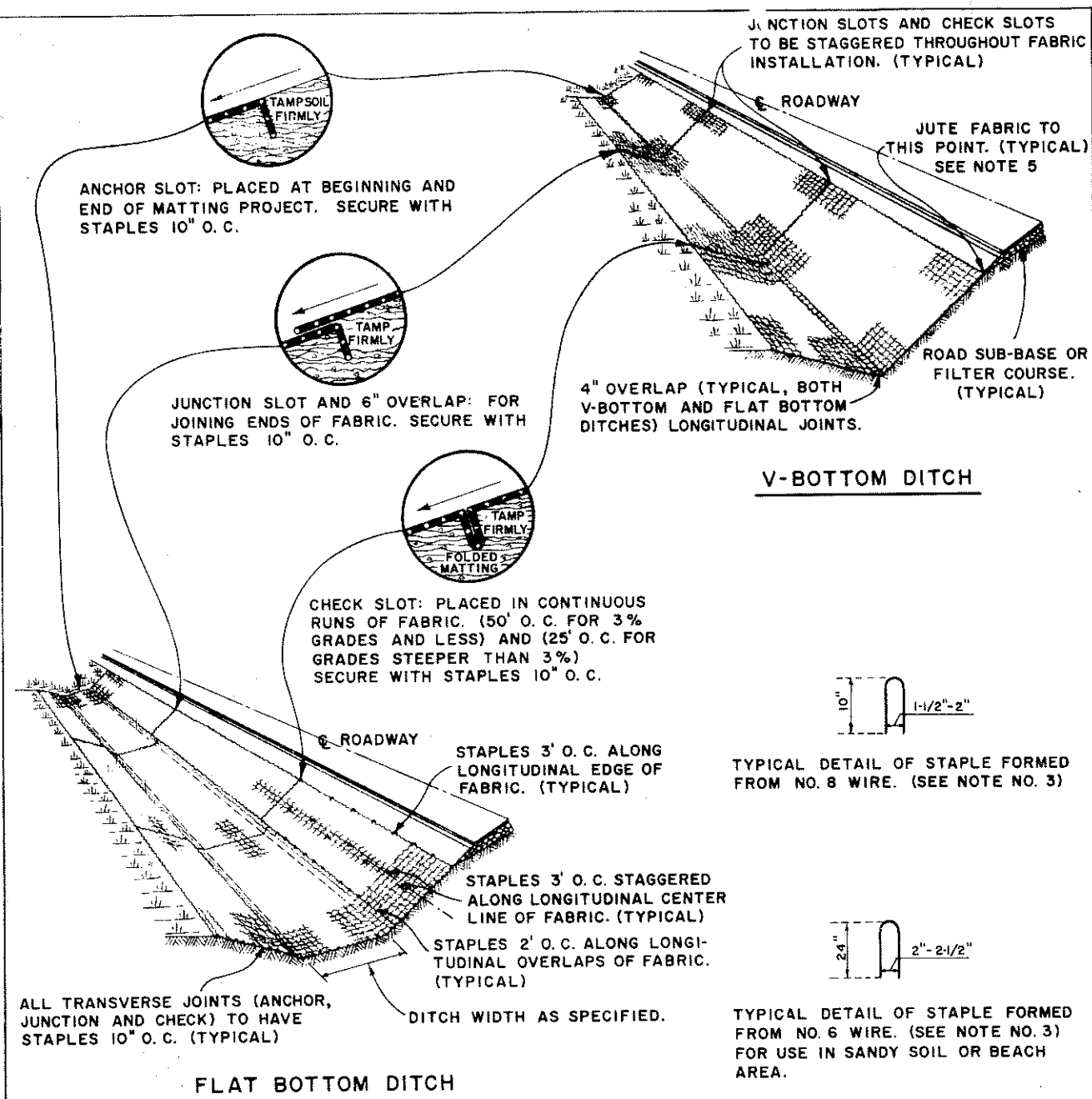
b. Watering. - The contractor shall be responsible for the watering of all seeded and grassed areas which shall be kept moist. The Contracting Officer's decision will prevail in the event a dispute develops with the contractor as to whether or not the seeded and grassed areas are moist. Seeded areas on which growth has started shall be watered to a minimum depth of 2 inches to assure continuing growth. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The contractor shall furnish sufficient watering equipment to apply one complete coverage to the seeded areas in a 96-hour period.

indicated on the drawings or as staked in the field. Payment for topsoiling will be made at the contract unit price for Item 49, "Topsoiling, Rehandle and Place", which price shall include all costs of salvaging, furnishing, segregation from excavations, loading, hauling, preparation of subgrade, spreading topsoil, grading, tillage, preparation of seedbeds, all labor and incidentals. No measurement or payment for placing stripping material will be made in borrow areas where all operations in connection with stripping, stockpiling and replacing stripping material shall be considered operations incidental to the borrow excavation operations. No measurement or payment will be made for areas specified in Paragraph 17-03a(2) and (3).

b. Seeding. - (1) Areas seeded will be measured by the acre on the basis of the number of acres measured. The acres will be computed to the nearest 1/10th of an acre. For measurement purposes, acres to be computed will be considered as horizontal projections of the ground surface. Payment for seeding will be made at the contract price per acre for Item 50, "Seeding on Class A and B Seedbeds", which price shall include all costs of finished grading, preparation of seedbed, application of fertilizer, lime and mulch; application of seed, and the furnishing of all labor, materials, including seed, fertilizer, lime and mulch, equipment and incidentals necessary to complete the seeding, and costs of maintenance and establishment. No measurement or payment will be made for seeding areas specified in Paragraphs 17-03a(2) and (3) and for seeding in borrow area.

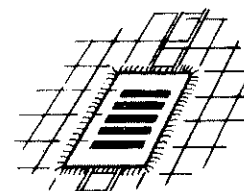
(2) In Borrow Areas. - No measurement or payment will be made for seeding in Borrow Areas, including establishment and maintenance, where all operations in connection with seeding shall be considered subsidiary obligations of the contractor incidental to borrow excavation operations.

c. Jute Erosion Control Matting. - Jute erosion control matting will be measured for payment on the basis of the number of square yards of matting acceptably installed, maintained and repaired in accordance with the provisions of this section of the specifications, as computed from the neat lines and grades indicated on the drawings or as staked in the field. Payment for jute erosion control matting will be made at the contract unit price per square yard for Item 53, "Jute Erosion Control Matting", which price shall include all costs of preparation of areas of application, installation of the matting, and maintenance and repair as required by Paragraph 17-14Ad of this section of the specifications, and the furnishing of all labor, materials, including matting and staples, equipment and incidentals necessary to complete the installation of the matting. No measurement or payment will be made for work included under other payment items.



NOTES:

1. PROVIDE SMOOTH CHANNEL TO REDUCE TURBULENCE AND UNDER-CUTTING. ROCKS, ROOTS AND LUMPS CAUSE BRIDGING, ALLOWING WATER TO FLOW UNDER MATTING.
2. ALL SLOTS (ANCHOR, JUNCTION AND CHECK) TO BE 6" TO 8" DEEP. MATTING TO BE PRESSED FIRMLY INTO SOIL AND STAPLED.
3. STAPLES MADE FROM NO. 6 OR 8 WIRE SHALL BE USED TO ANCHOR MATTING. STAPLES MUST BE FLUSH WITH GROUND TO ASSURE SMOOTH WATER FLOW.
4. WHERE JUTE MATTING IS SPECIFIED FOR HIGH EMBANKMENT SLOPES THE FABRIC MAY BE LAID LONGITUDINALLY OR VERTICALLY ON THE SLOPE.
5. BEGIN JUTE INSTALLATION PARALLEL TO EDGE OF ROAD (OR AT TOP EDGE OF FIELD DITCH). PROGRESS Laterally TO TOP OF BACKSLOPE (OR FAR EDGE OF FIELD DITCH).



PRESS ENDS OF JUTE 6" INTO SOIL AROUND DRAIN. TAMP FIRMLY.

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

JUTE MATTING INSTALLATION DETAILS

DATE: AUG. 1961

SECTION 18

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SECTION 18

STORAGE BUILDING (Item 48)

18-01. SCOPE. - a. The work covered by this section of the specifications consists in furnishing all labor, plant, equipment, materials and appliances, and performing all operations in connection with construction of a storage building, complete, in strict accordance with this section of the specifications and Sketch No. 106, inclosed at end of this section, and subject to the terms and conditions of the contract.

b. The storage building will be located along existing Wales Road, downstream of the dam, where shown. The exact location will be determined in the field by the Contracting Officer. The contractor shall provide a suitable access driveway to the building.

c. The storage building will be utilized as a project laboratory during the work under this contract. The building shall be completed and all equipment installed in sufficient time to permit any required testing as required under Paragraph SC-40. The contractor shall maintain access to the building at all times, shall provide temporary electric service, and shall provide janitor and maintenance services, and shall pay for all electricity used during the contract work. The contractor shall provide drinking water, bottled water type dispenser, in the building.

d. All items installed in the building shall remain and become the property of the Government. The temporary electric service shall be removed upon completion of the entire work.

18-02. EXCAVATION, BACKFILLING, AND GRADING. - a. General. - All work shall be executed as required to construct the building including the access driveway (except gravel surface). Shoring and unwatering the construction area shall conform to the applicable requirements of Section 3, EXCAVATION, and as stated below. All excavation shall be unclassified and shall include the removal of any rock and boulders encountered. Road gravel shall be furnished and placed as specified in Section 6.

b. Grading. - The entire building area including access drive shall be rough graded prior to excavation or fill for the building foundations. Fill shall be brought up to the underside of subgrade for sand and gravel drainage fill under slabs and for subgrade for road gravel.

c. Excavation. - Excavations shall conform to the dimensions and elevations shown on the drawings or as required for the construction

of features covered in this section. Excavation shall generally extend 12 inches outside the walls to allow for placing and removal of forms, installation of services, and for inspection. Undercutting will not be permitted. Suitable excavated material which is required for fill under slabs shall be separately stockpiled as directed.

d. Excess Material. - Material from excavation, not required for fill or backfill, shall be used or disposed of as specified in Section 3 of these specifications.

e. Sand and Gravel Fill. - Sand and gravel fill under concrete slabs including ramp shall meet all the requirements for Gravel Fill material as specified in Section 5, except that the material shall contain no stones greater than 3 inches in size. The 6-inch layer of sand and gravel fill beneath floor and slab shall be placed in one layer and compacted by four coverages of vibratory compactors or pneumatic tampers.

f. Filling near Foundation Walls. - Where filling is done beside foundation walls, the fill shall be brought up essentially at the same heights on both sides at all times until the maximum level at the lower side is reached. Where a higher level of fill is required on one side of the foundation wall, the higher level must be properly compacted. Where a roller or tractor is used for compaction, the roller or tractor edge must not approach nearer than four feet from the face of the wall.

g. Backfilling. - After completion of foundation walls and other construction below the elevation of the final grade, and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of materials from required excavations or other materials approved by the Contracting Officer. Each layer shall be compacted by machine tampers or by other suitable mechanical equipment to a density that will prevent excessive settlement or shrinkage. Precautions outlined above relative to filling near foundation walls, shall be observed while backfilling.

18-03. CONCRETE. - a. General. - All concrete work required for the building shall conform with the applicable requirements of Section 9, CONCRETE, with the following additional provisions:

(1) The maximum size aggregate shall not exceed 3/4 inch.

(2) Finish. - The exposed concrete surfaces shall have all fine and rough edges removed, holes remaining from the bolts or rods and slight honeycomb and minor defects patched with mortar composed of 1 part cement to 2 parts sand. Concrete floor and ramp shall be left with a wood float finish.

(3) Expansion Joints. - Expansion joints shall be constructed as indicated on the drawings and where slab abuts vertical surfaces. Joints between slabs on earth and vertical surfaces shall be premolded expansion-joint filler strips conforming to Federal Specification HH-F-341a. Joints shall be 3/8 inch thick (unless otherwise shown) and the full depth of slab. Edges of concrete floor or along expansion joints shall be neatly finished with a slightly rounded edging tool.

b. Slabs on Grade. - The subgrade shall be brought to an even plane and compacted solid. Sand and gravel fill shall be deposited to the indicated thickness, and compacted and graded reasonably level. The fill under floor slab shall be covered with vapor barrier. Concrete shall be deposited to the required thickness, and finished as specified above.

18-04. SHEET METAL WORK AND MISCELLANEOUS METALS. - a. Materials. -

(1) Anchor bolts for anchoring the sills to the foundation walls shall be 1/2-inch diameter, 12 inches long, spaced on four-foot centers. The projecting portion shall be given a coat of red lead.

(2) Sheet metal for cap flashing over doors and windows shall be 16-ounce cold rolled copper.

(3) Window grilles. - Grille frames shall be 1 x 1/2 x 1/8 inch cold rolled channels with covers mitered and welded. Fabric shall be No. 10 gage steel wire, woven into 1-1/2-inch diamond mesh securely clinched or welded to framing. Straps, 1/8-inch thick by 1-1/2-inch wide, spaced not over 18 inches apart and with one in each corner, shall be welded to frame for securing grilles to window frames. Straps shall be shaped as required and secured to building construction with lag screws extending through straps and at least 2 inches into building studding or blocking. Heads of lag screws shall be made tamperproof by welding head to straps or in a manner satisfactory to the Contracting Officer.

b. Flashing. - Cap flashing shall be provided at head of doors and windows to provide watertight protection. Exposed edges of all flashings shall be folded back 1/2 inch to provide stiffness. Flashing at openings shall extend not less than 4 inches beyond the jambs of the opening. Wall flashings shall be installed, as required, to provide watertight construction.

18-05. CARPENTRY. - a. Lumber and Woodwork. - Lumber shall conform to Federal Specification MM-L-00736a (GSA-FSS) for "Lumber and Timber, Hardwood", and MM-L-00751f (GSA-FSS) & Am-1, for "Lumber and Timber, Softwood". A certificate of conformance with Federal Specifications will be accepted in lieu of inspection requirements. At the contractor's option, lumber for the various uses shall be one of the species listed for the purpose and of the grade indicated.

(1) Rough Carpentry. -

| SPECIES AND GRADE | | | |
|------------------------------------|--|---------------------|-------|
| | Douglas Fir | | |
| | Sitka Spruce | Northern White Pine | White |
| | Western Red Cedar | Eastern Spruce | Fir |
| Rafters, Sills and Joists | Any stress-graded species - 1100 f., 850 c., 1,320,000 E. | | |
| Studs, Plates, Caps, Nailers | Standard | No. 2 | No. 2 |
| Roof and Wall Sheathing | Interior type Douglas fir plywood with exterior glue, C-D grade, minimum 1/2 inch thick. | | |
| Bridging, Ridge Boards and Bracing | Standard | No. 3 Boards | No. 3 |

(2) Exterior Finished Carpentry. -

| SPECIES AND GRADE | | | |
|------------------------|---|---------------------|--|
| | Douglas Fir | | |
| | Sitka Spruce | Northern White Pine | |
| | Western Red Cedar | Eastern Spruce | |
| Siding | C and better | C Select | |
| Cornices | C and better | C Select | |
| Trim and Corner Boards | C and better | C Select | |
| Window and Door Frames | Practically clear material without obvious defects. Window jambs, parting strips, and sills of Douglas fir, and sills of Sitka spruce shall be VG or EG. Door frames shall be of second grade for paint finish. | | |

b. Other Materials. - (1) Waterproof Sheathing Paper. - Waterproof sheathing paper shall conform to Federal Specification UU-P-147b for "Paper; Building, Waterproof", Type I, Class B.

(2) Lag Screws. - Lag screws shall conform to Federal Specification FF-B-561b for "Bolts, Lag".

(3) Nails. - Nails shall conform to Federal Specification FF-N-105a for "Nails, Wire, Brads, and Staples".

(4) Screws. - Screws shall conform to Federal Specification FF-S-111b, for "Screw, Wood".

(5) Asphalt Saturated Felt. - Asphalt saturated felt shall conform to Federal Specification HH-F-191a & Am-2 for "Felt; Asphalt-Saturated (for) Flashings, Roofing, and Waterproofing"

(6) Glass. - Glass shall conform to Federal Specification DD-G-451a & Am-1 for "Glass, Flat and Corrugated for Glazing, Mirrors and Other Uses." All glass shall be type II, B quality, double-strength, clear glass.

c. Framing and Boarding. - (1) Lumber and Other Rough Work. - Lumber and other rough work shall be properly framed, closely fitted, accurately set to the required lines and rigidly secured in place. No shims will be allowed on wood or metal bearings. Members shall be framed to allow for passage of pipes to avoid cutting of structural members. No members shall be cut, notched, or bored for the passage of such pipes without prior approval. All corners shall be wind braced. Ridge shall be straight and true intersections of the roof planes. Rafters on plates and ridge shall be framed with close joints. Blocking not less than 2 x 4-inch stock or size of framing member shall be placed between rafters and studs where necessary to form nailings for roof and wall sheathing. Bridging shall be provided where required.

(2) Wall and Roof Sheathing. - All nailing shall be into framing. No nails shall be visible from interior of building.

(a) Wall Sheathing. - Edges or ends of plywood sheets shall extend over and be nailed to sill and top plates. End joints shall be butted over centerline of supports and when applied horizontally, end joints shall be staggered. Eightpenny common nails shall be used. Nails shall be spaced 6 inches on centers along ends and bearing edges and 12 inches on centers along intermediate bearings. Waterproof sheathing paper shall be applied over sheathing, shall be applied horizontally, starting at bottom, and lapped 6 inches at ends and edges.

(b) Roof Sheathing. - Plywood shall be provided with blocking installed at edges of sheets or H-shaped metal clips designed for the purpose shall be inserted along the edges midway between supports. Plywood panels shall be continuous over two or more spans, applied with the face-ply grain across supports and secured at 6 inches on centers along ends and bearing edges and at 12 inches on centers along intermediate bearings with eightpenny common nails. End joints shall be butted over the centerline of supports and staggered.

(3) Rafters and ceiling joists, sizes as shown, shall be spaced 16 inches on centers.

(4) Studs. - Studs shall be 2" x 4", spaced 16 inches on centers. Plates resting on concrete walls shall be anchored in place with 1/2-inch bolts. Studs shall be built-up double round openings and trussed over all doors and windows. Corners shall be thoroughly spiked together and made solid. All walls shall be provided with top and bottom plates. Walls shall have at least one row of horizontal bridging full width of studding, cut and securely nailed. Studs shall be framed as required for the proper installation of plumbing. Nailing strips shall be cut as required for the support of fixtures of all kinds.

d. Exterior Finish. - (1) All exterior finish shall be milled from materials specified and erected in strict conformance with details. The exposed surfaces of finish woodwork shall be smooth and ready to receive paint or other finish. All nailing shall be blind or face nailing as required with face nails set for putty-stopping. Cornice and other exterior trim and millwork shall be constructed so that water cannot pass through the joints. Molded work shall be coped at returns and interior angles and mitered at corners. Intersections of flat work shall be shouldered. Rake mouldings shall be run to profile required to miter with horizontal moldings.

(2) Wood siding shall be drop siding type and shall be applied over the wall sheathing and building paper. Ends of boards likely to split when nailed shall be drilled. End joints shall be made over centerline of framing supports. Joints shall be staggered and, when made on same support, shall be separated by at least two courses. End joints and joints at openings, corners, and gables shall be made with white-lead paste. Siding shall be nailed to each support with not less than two nonferrous metal nails. Nails shall be of the length that will penetrate sheathing and provide not less than 1-1/2-inch penetration into support. Siding courses shall fit full into the worked edges of the adjacent board without forcing.

e. Window Frames. - Double-hung frames shall have 3/4 inch jambs, heads, and blind stops, 1/2-inch by 3/4-inch parting strips, 1-5/8-inch sills and 1-1/8-inch side and head castings. Jambs and heads shall be cut as required by the type of spring balances specified. Sills shall be run with weather breaks on top and one or more grooves on bottom.

f. Sash. - Nominal thickness of double-hung sash shall be 1-3/8 inches. Ponderosa Pine sash shall conform to CS 163 59 & Errata sheet, 2 February 60. Sash of Douglas fir, cypress, or southern pine shall be of the same construction and quality as specified for Ponderosa pine. Double-hung sash shall be check-rail type, shall be grooved for attachment of sash balances. Sash shall be fitted closely after frames are set, shall be made to work free and easy, and shall be well-balanced. Windows shall be of a type that can be easily removed from the interior for cleaning. All glass shall be set in best quality putty.

g. Insect Screens. - Half-length insect screens, wood or metal type optional with contractor shall be provided for all windows.

h. Door Frame. - Exterior door frame for swing door shall be 1-3/4 inches thick, double-rabbeted from the solid. Double wedge blocking shall be driven back of jambs at nailing points and at back of butts and lock strikes.

i. Doors. - (1) General. - Doors shall be of the design and sizes indicated and shall be fabricated in accordance with the best practice of the trade, with all joints properly formed, tightly fitted and tenoned. Exterior door shall be flush type, 1-3/4-inch thick. Exterior door shall be provided with interlocking type threshold and shall be completely weatherstripped at sill, jambs, and head.

(2) Swing Door. - Top and bottom edges of door shall be given two coats of spar varnish at the factory before shipment. Exterior door shall be fabricated with water-resistant adhesives. Exterior door shall be softwood-veneered and shall have solid core of the stile and rail-type. Door, when constructed without cross-banding, shall have sawn or sliced face veneers not less than 3/16-inch thick before sanding, and when cross-banded, combined thickness of cross-banding and face veneer on each face shall be not less than 3/16-inch before sanding. Otherwise, softwood-veneered door of Ponderosa Pine shall conform to CS 120-58, grade 1; of Douglas fir, Sitka spruce, or western hemlock shall have vertical grain faces for paint finish and construction and quality shall be equal to those required by CS 91-41.

(3) Overhead Door. - Door shall be sectional overhead type and shall be constructed of 1-3/8-inch thick, mortised and tenoned, glued, steel doweled, stiles and rails with rebated weather joints throughout. Stiles shall be 3-1/2 inches wide at centers and 5-1/2 inches wide at ends. Center rails shall be 2-9/16" minimum, and top and bottom rails shall be 5-1/2" wide. Door shall be furnished with rubber weatherstrip at bottom. Door panels shall be 1/4-inch thick exterior grade plywood. Provide one horizontal row of fixed glazed panel in door; glass shall be bedded in elastic glazing compound. Counter balancing hardware shall be torsion-spring type on cross header steel shaft. All metal parts such as tracks, guides, bracing and hardware shall be furnished with the door to complete the installation. Tracks shall be 2-inch size and furnished for a 10-inch maximum head radius with adjustable jamb brackets on the verticals. All metal parts shall be galvanized steel. Door sections shall be hinged at rail center stile and end stile. Door shall be erected in accordance with manufacturer's instruction.

(4) Fittings, Hanging and Trimming. - The contractor shall set, fit, and hang all doors. Swing door shall have 1/16-inch clearance

at side and top and 3/8-inch clearance at the bottom, and shall be hung and trimmed with hardware as specified. Screens shall be provided with aluminum glides and shall be fitted and made insect tight.

1. Blocking. - Wood blocking and strapping shall be furnished as required for proper support or finish and sheathing and for attachment of other items of work.

18-06. LABORATORY EQUIPMENT. - a. Table. - Table shall be 30 inches high, shall be of metal, shall be equipped with four drawers, and shall be constructed with sturdy metal frame.

b. Sink. - One single stainless steel sink, connected to trap and drain line. Drain line shall be carried outside the building to natural drain. Drain line shall be so constructed that fine-grained soils and cement may be washed down drain without plugging the system. Sink shall be provided with one cold water faucet. The contractor shall mount a 100-gallon tank outside the building to provide water supply for sink, and shall fill tank as required. The sink trap shall conform to Federal Specification WW-P-541b & Am-4, No. 106 trap.

c. Tank. - The tank shall be a curing tank and constructed of 14-gage galvanized sheet metal reinforced to perform satisfactorily. The tank shall be equipped with drainage plugs, electric stirrer and immersion heater, thermostatically controlled which will maintain a constant uniform water temperature between 68° F. and 78° F. All necessary electric outlets and services for operation of stirrer and heater shall be supplied.

18-07. PAINTING. - a. General. - The contractor shall paint all exterior woodwork, including door and window frames, siding, window sills, and trim, and door butts. Painting shall include both sides of swing and overhead doors. No interior painting is required.

b. Materials. -

Prime Coat - Federal Specification TT-P-25a & Am-1.

Finish Coats - Federal Specification TT-P-102a, Class B, light tints; TT-P-53c & Am-1, yellow; TT-P-81d other medium colors. Color shall be selected by Contracting Officer from color chips submitted by contractor. Two colors shall be required, one for siding, and the other for doors, windows and trim. Paint will be accepted on the basis of certificates of compliance.

c. Workmanship. - The contractor shall apply one prime coat and two finish coats to all surfaces required to be painted. Paint shall be applied in accordance with manufacturer's instructions and as specified in the applicable Federal Specifications.

18-08. ELECTRICAL WORK. - a. The contractor shall provide a temporary service to the building. The building shall be provided with a 120/240 volts, 100-amp, single phase, 3-wire, electric system.

b. The contractor shall provide a 7-1/2 KW unit heater. Lighting fixtures shall be commercial fluorescent type. Each receptacle shall be on a separate circuit. Lighting shall be controlled by switch near door.

c. All electrical work shall conform to the National Electrical Code and any applicable local and utility regulations.

18-09. BUILDERS' HARDWARE. - a. General. - Builders' hardware shall be furnished and installed as required by the specifications. All items of builders' hardware shall be carefully fitted and securely attached. Care shall be exercised not to mar or injure other new work. Upon completion of the work, the contractor shall, in the presence of the Contracting Officer, show that all hardware works in perfect order, shall fit all keys in their respective locks, and upon acceptance of the work shall tag and deliver all keys to the Contracting Officer. Oilite bearing butts may be furnished in lieu of ball bearing butts at option of the contractor.

b. Lock Sets. - Lock sets shall embody locking mechanism herein specified and trim conforming to the design specified. Where the exact types of hardware specified are not adaptable to the finished shape or size of members requiring the hardware, suitable types having as nearly as practicable the same operation and quality as type specified shall be furnished. Locks shall have beveled, rounded or rabbeted faces where required. Solid or wrought bronze knobs shall be installed on the swing door.

c. Materials. - Materials, unless otherwise specified, shall conform to the applicable requirements of the following Federal Specifications:

| | |
|-----------|------------------------------------|
| FF-H-106a | Hardware, Builders; Locks and Door |
| & Am-1 | Trim. |
| FF-H-111a | Hardware, Builders; Shelf and |
| & Am-1 | Miscellaneous. |
| FF-H-116c | Hinges, Hardware, Builders. |
| & Am-4 | |

Hardware for the various items shall conform to the requirements set forth below:

Double Hung Windows

| | |
|-----------------|------------|
| 2 Sash Balances | Type F1245 |
| 1 Fastener | Type 1140 |
| 2 Sash Lifts | Type 1212 |

Window Screens

Sash Lifts

Type 1212 - 2 each screen

Overhead Door

Hardware as recommended by door manufacturer for type of door specified. Door shall be provided with a cylinder locking device which provides for operations from both sides of door with key from exterior.

Exterior Door

3 Butts - 4-1/2 x 4-1/2 Type 2107 x USP
1 Lock and Lock Set Type 161A-4

d. Key. - Each cylinder lock shall be spin tumbler type and shall be provided with three keys. All locks shall be keyed alike. All keys shall be stamped with the change number.

e. Finish. - Hardware for exterior face of exterior door and window sash, unless otherwise specified, shall be dull bronze; US-10. All butts shall have a priming coat for painting.

18-10. ROOFING. - Thick butt asphalt strip shingles conforming to Federal Specification SS-S-298b, or uniform thickness shingles conforming to Federal Specification SS-S-300b, type II, shall be applied by workmen skilled at the trade and shall be laid in accordance with the manufacturer's specifications. Shingles shall be 3 tab, and except at ridges, shall be 12 inches by 36 inches. Colors shall be selected from manufacturers' standard color range by the Contracting Officer. Shingles shall be laid with wood shingle starter course with all courses not more than 5 inches to the weather. A layer of asphalt saturated felt shall be nailed on the sheathing prior to application of shingles.

18-11. SHADES. - a. General. - Shades shall be installed on all windows.

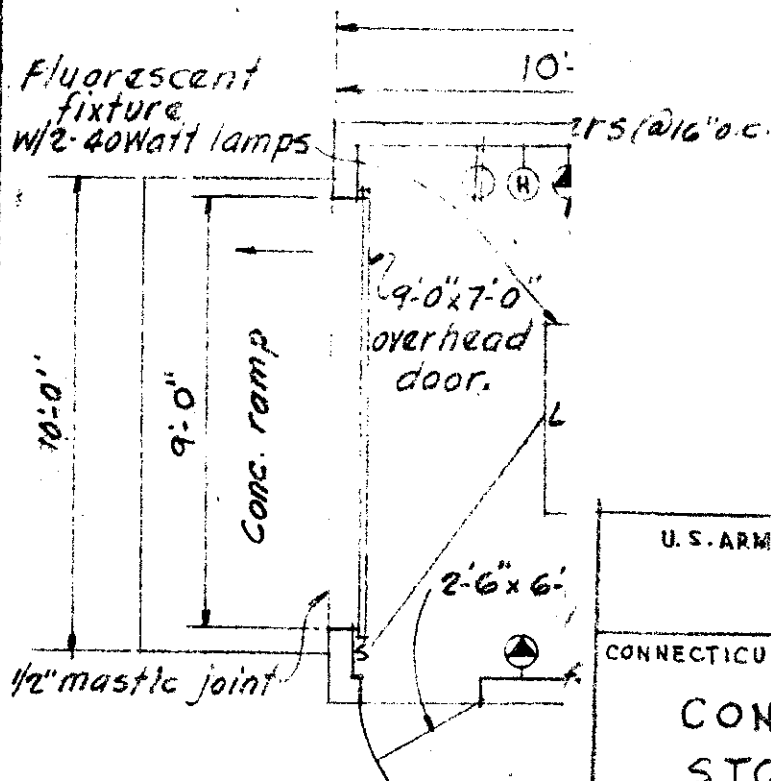
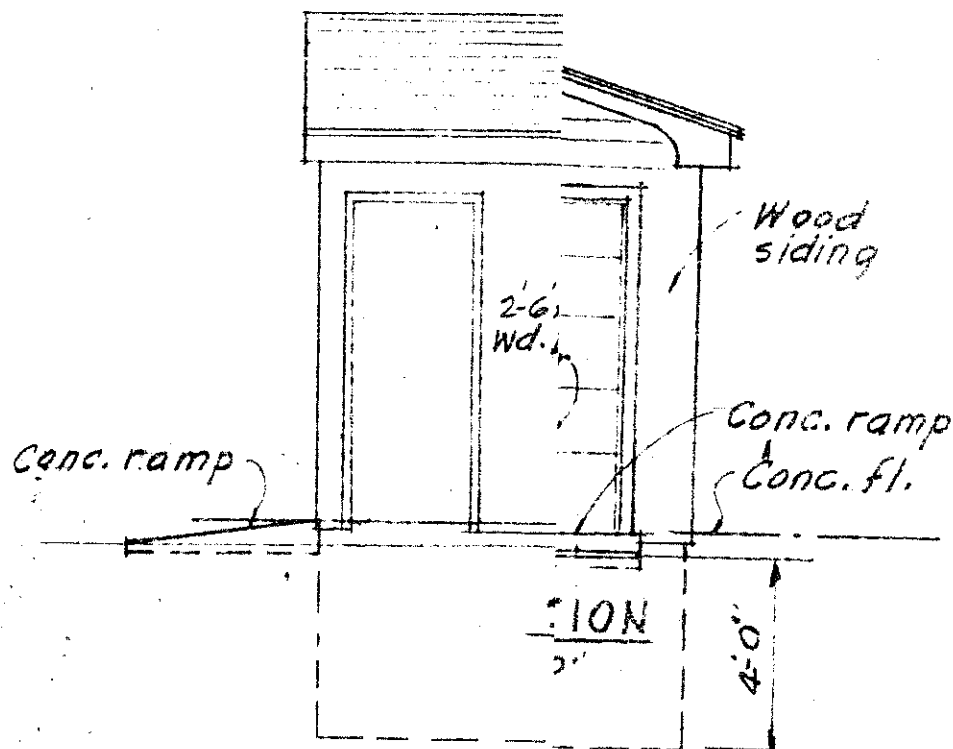
b. Materials. - Materials shall conform to the following Federal Specifications:

| | |
|----------------------|---|
| DDD-S-251c | Shades, Roller, Window; Roller, Slat, Cord, and Accessories. |
| CCC-C-521c & Am-1 | Cloth, Coated Window Shade, white color. |

Brackets may be malleable iron, stamped steel, or brass, with a brass, copper, nickel, or chromium finish.

c. Installation. - Shades shall be installed in accordance with the manufacturer's instructions. Brackets shall be accurately located and solidly fastened in place, care being taken not to mar or damage existing work. The contractor shall operate all shades in the presence of the Contracting Officer before final acceptance.

18-12. PAYMENT. - Payment for all work specified herein, except for gravel access drive will be made at the lump sum contract price for the Item 48, "Storage Building", and will include all costs for grading, earth and rock excavation for foundations, backfilling, fill, heating, electrical and plumbing, and concrete.



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

CONNECTICUT RIVER FLOOD CONTROL PROJECT

CONANT BROOK DAM
STORAGE BUILDING
PLAN, ELEVATIONS & SECTION
CONANT BROOK MASSACHUSETTS
SK. NO. 106 DATE: JAN. 1964

B I D F O R M
(CONSTRUCTION CONTRACT)

REFERENCE

Serial No. CIVENG-19-016-64-43

Read the Instructions to Bidders (Standard Form 22)

This form to be submitted in duplicate

DATE OF INVITATION

2 April 1964

NAME AND LOCATION OF PROJECT

CONSTRUCTION OF CONANT BROOK DAM,
HIGHWAY RELOCATIONS, AND APPURTENANT
STRUCTURES, MONSON, MASS.

NAME OF BIDDER (Type or print)

(Date)

TO: Division Engineer
U.S. Army Engineer Division, New England
424 Trapelo Road
Waltham, Mass. 02154

In compliance with the above-dated invitation for bids, the undersigned hereby proposes to perform all work for the Construction of Conant Brook Dam, Highway Relocations and Appurtenant Structures, Monson, Massachusetts

in strict accordance with the General Provisions (Standard Form 23-A), Labor Standards Provisions Applicable to Contracts in Excess of \$2,000 (Standard Form 19-A), specifications, schedules, drawings, and conditions, for the following amount(s)

See attached Unit Price Schedule.

Supplement to Bid Form, Pages numbered 1 and 2, Certification of Noncollusion (Nov. 1963), and Plant and Equipment Schedule, attached hereto, forms a part of this bid as does attached Unit Price Schedule

The undersigned agrees that, upon written acceptance of this bid, mailed or otherwise furnished within calendar days (60 calendar days unless a different period be inserted by the bidder) after the date of opening of bids, he will within 10 calendar days (unless a longer period is allowed) after receipt of the prescribed forms, execute Standard Form 23, Construction Contract, and give performance and payment bonds on Government standard forms with good and sufficient surety.

The undersigned agrees, if awarded the contract, to commence the work within 15 calendar days after the date of receipt of notice to proceed, and to complete the work within

* calendar days after the date of receipt of notice to proceed.

*For completion date or dates see Paragraph SC-1 of the specifications.

(Continue on other side)

Receipt of Amendments: The undersigned acknowledges receipt of the following amendments of the invitation for bids, drawings, and/or specifications, etc. (Give number and date of each):

The bidder represents (Check appropriate boxes):

(1) That he ☐ is, ☐ is not, a small business concern. (For this purpose, a small business concern is a business concern, including its affiliates, which (a) is independently owned and operated, (b) is not dominant in its field of operation, and (c) had average annual receipts for the preceding three fiscal years not exceeding \$7,500,000 For additional information see governing regulations of the Small Business Administration.)

(2) (a) That he ☐ has, ☐ has not, employed or retained any company or person other than a full-time bona fide employee working solely for the bidder) to solicit or secure this contract, and (b) that he ☐ has, ☐ has not, paid or agreed to pay any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer.

(For interpretation of the representation, including the term "bona fide employee," see Code of Federal Regulations, Title 41, Subpart 1-1.5.)

(3) That he operates as an ☐ individual, ☐ partnership, ☐ joint venture, ☐ corporation, incorporated in State of

Enclosed is bid guarantee, consisting of

in the amount of

(with residential

NAME OF BIDDER (Type or print)

FULL NAME OF ALL PARTNERS (Type or print) addresses)

BUSINESS ADDRESS (Type or print)

BY (Signature in ink. Type or print name under signature)

TITLE (Type or print)

DIRECTIONS FOR SUBMITTING BIDS

Envelopes containing bids, guarantee, etc., must be sealed, marked, and addressed as follows:

Division Engineer
U.S. Army Engineer Division, New England
424 Trapelo Road
Waltham, Mass. 02154

Bids may be delivered in advance to the Bids Receiving Desk in Bldg. 109S at the above address, or delivered directly to the Contracting Officer in Bldg.

126 (Theater) just prior to the bid opening.
CAUTION: Bids should not be qualified by exceptions to the bidding conditions.

UNIT PRICE SCHEDULE

| <u>Item No.</u> | <u>Description</u> | <u>Quantity</u> | <u>Unit</u> | <u>Unit Price</u> | <u>Estimated Amount</u> |
|-----------------|---|-----------------|----------------------------|-------------------|-------------------------|
| 1 | Preparation of Site | 1 | Job | L.S. | \$ _____ |
| 2 | Control and Diversion of Water | 1 | Job | L.S. | _____ |
| *3 | Unclassified Excavation-General | 180,000 | C.Y. | \$ _____ | _____ |
| *4 | Unclassified Excavation-Borrow | 330,000 | C.Y. | _____ | _____ |
| *5 | Rock Excavation | 60,000 | C.Y. | _____ | _____ |
| 6 | OMITTED | | | | |
| 7 | Hand Cleaned Bedrock Surfaces | 300 | (100 sq. ft.) Square | _____ | _____ |
| 8 | Foundation Drilling and Grouting | | | | |
| | <u>a.</u> Mobilization and Demobilization | 1 | Job | L.S. | _____ |
| | <u>b.</u> Drilling 1-1/2"(EX) Grout Holes | 1650 | L.F. | _____ | _____ |
| | <u>c.</u> Drilling 3"(NX) Drain Holes | 140 | L.F. | _____ | _____ |
| | <u>d.</u> Drilling 3"(NX) Exploratory Holes | 100 | L.F. | _____ | _____ |
| | <u>e.</u> Portland Cement in Grout | 1400 | C.F. | _____ | _____ |
| | <u>f.</u> Sand in Grout | 100 | C.F. | _____ | _____ |
| | <u>g.</u> Placing Grout | 1500 | C.F. | _____ | _____ |
| | <u>h.</u> Connection to Grout Holes | 285 | Ea. | \$5.00 | 1,425.00 |
| *9 | Compacted Highway Fill | 91,000 | C.Y. | _____ | _____ |
| *10 | Compacted Impervious and Random Fills | 220,000 | C.Y. | _____ | _____ |

UPS-1

C

Serial No. CIVENG-19-016-64-43

| <u>Item No.</u> | <u>Description</u> | <u>Quantity</u> | <u>Unit</u> | <u>Unit Price</u> | <u>Estimated Amount</u> |
|-----------------|--|-----------------|-------------|-------------------|-------------------------|
| 11 | Compacted Impervious Backfill | 300 | C.Y. | \$ _____ | \$ _____ |
| *12 | Compacted Processed Sand Fill | 10,000 | C.Y. | _____ | _____ |
| 13 | Compacted Gravel Fill | 1,200 | C.Y. | _____ | _____ |
| 14 | Compacted Gravel Backfill | 150 | C.Y. | _____ | _____ |
| *15 | Compacted Sand Fill | 30,000 | C.Y. | _____ | _____ |
| *16 | Gravel Bedding | 27,500 | C.Y. | _____ | _____ |
| 17 | Road Gravel | 1,300 | C.Y. | _____ | _____ |
| 18 | Additional Rolling of Fill | 100 | Hrs. | _____ | _____ |
| *19 | Rock Slope Protection | 48,000 | C.Y. | _____ | _____ |
| 20 | Anchor Bars | 23 | Ea | _____ | _____ |
| 21 | Concrete-Outlet Works-Intake and Outlet | 500 | C.Y. | _____ | _____ |
| 22 | Concrete-Outlet Works-Conduit Sta. 3/93 to Sta. 7/77 | 480 | C.Y. | _____ | _____ |
| 23 | Concrete-Spillway-Weir and Walls | 550 | C.Y. | _____ | _____ |
| 23A | Concrete for Foundation Preparation | 50 | C.Y. | \$60.00 | 3,000.00 |
| 24 | Portland Cement | 2400 | Bbl. | _____ | _____ |
| 25 | Steel Reinforcement | 20,000 | Lb. | _____ | _____ |
| 26 | Pipe Conduit | 1 | Job | L.S. | _____ |
| 27 | Bubble Gage Shelter | 1 | Job | L.S. | _____ |
| 28 | Pipe, ACCM, 15-inch | 430 | L.F. | \$ _____ | _____ |
| 29 | Pipe, ACCM, 18-inch | 55 | L.F. | _____ | _____ |
| 30 | Pipe, ACCM, 21-inch | 85 | L.F. | _____ | _____ |
| 30A | Pipe, ACCM, 24-inch | 70 | L.F. | _____ | _____ |

Serial No. CIVENG-19-016-64-43

| <u>Item No.</u> | <u>Description</u> | <u>Quantity</u> | <u>Unit</u> | <u>Unit Price</u> | <u>Estimated Amount</u> |
|-----------------|---|-----------------|-------------|-------------------|-------------------------|
| 31 | Pipe, ACCM, 30-inch | 135 | L.F. | \$ _____ | \$ _____ |
| 32 | Pipe, Culvert, ACCM, 54-inch | 1 | Job | L.S. | _____ |
| 33 | Pipe, Culvert, Bituminous Coated, Multi-Plate, 15-foot diameter | 1 | Job | L.S. | _____ |
| 34 | Pipe, Culvert, Bituminous Coated, Multi-Plate, 17-foot diameter | 1 | Job | L.S. | _____ |
| 35 | Drop Inlets (Type C) | 4 | Ea. | _____ | _____ |
| 36 | Pipe Bedding | 880 | C.Y. | _____ | _____ |
| 36A | Culvert Backfill | 2,090 | C.Y. | _____ | _____ |
| 37 | Miscellaneous Metal Items Intake and Outlet Structures | 1 | Job | L.S. | _____ |
| 38 | Chain Link Fencing | 1,900 | L.F. | _____ | _____ |
| 39 | Gates - 12 feet, Chain Link | 3 | Ea. | _____ | _____ |
| 40 | Log Boom | 1 | Job | L.S. | _____ |
| 41 | Staff Gages | 1 | Job | L.S. | _____ |
| 42 | Cable Guard Railing | 6,010 | L.F. | _____ | _____ |
| 43 | Bumper Guard | 175 | L.F. | _____ | _____ |
| 44 | Gravel Base and Surface Courses and Shoulders | 18,300 | C.Y. | _____ | _____ |
| 45 | Bituminous Concrete Pavement, 2-inch | 4,100 | S.Y. | _____ | _____ |
| 45A | Bituminous Concrete Pavement, 2-1/2-inch | 31,500 | S.Y. | _____ | _____ |

Serial No. CIVENG-19-016-64-43

| Item No. | Description | Quantity | Unit | Unit Price | Estimated Amount |
|----------|----------------------------------|----------|------|------------|------------------|
| 46 | Bituminous Surface Treatment | 3,200 | S.Y. | \$ _____ | \$ _____ |
| 47 | Bituminous Concrete Berms | 375 | L.F. | _____ | _____ |
| 48 | Storage Building | 1 | Job | L.S. | _____ |
| 49 | Topsoiling, Rehandle and Place | 7,100 | C.Y. | _____ | _____ |
| 50 | Seeding on Class A and B Seedbed | 20 | Acre | _____ | _____ |
| 51 | Concrete Bounds | 75 | Ea. | _____ | _____ |
| 52 | Paved Ditches | 950 | S.Y. | _____ | _____ |
| 53 | Jute Erosion - Control Matting | 1,300 | S.Y. | _____ | _____ |
| | | | | TOTAL \$ | _____ |

- NOTES: 1. The work will be awarded as a whole to one bidder
2. Only quantities for items with an asterisk adjacent to Item No. are subject to the provisions of Subparagraphs SC-7a and SC-7c of the SPECIAL CONDITIONS.

PLANT AND EQUIPMENT SCHEDULE

Available Plant to be Used

Excavation Equipment

| No. | Type | Capacity | Manufacturer | Age & Condition | Location |
|-----|------|----------|--------------|-----------------|----------|
| | | | | | |

Concreting Equipment

| No. | Type | Capacity | Manufacturer | Age & Condition | Location |
|-----|------|----------|--------------|-----------------|----------|
| | | | | | |

Material Handling Equipment

| No. | Type | Capacity | Manufacturer | Age & Condition | Location |
|-----|------|----------|--------------|-----------------|----------|
| | | | | | |

Add additional sheets if required.

PLANT AND EQUIPMENT SCHEDULE

Available Plant to be Used

Pumping Equipment

| No. | Type | Capacity | Manufacturer | Age & Condition | Location |
|-----|------|----------|--------------|-----------------|----------|
| | | | | | |

Earth Embankment - Rolled Fills

Excavation and Transportation - Spreading and Rolling

| No. | Type | Capacity | Manufacturer | Age & Condition | Location |
|-----|------|----------|--------------|-----------------|----------|
| | | | | | |

Add additional sheets if required.

Miscellaneous Equipment

| No. | Type | Capacity | Manufacturer | Age & Condition | Location |
|-----|------|----------|--------------|-----------------|----------|
| | | | | | |

P&ES-3

SUPPLEMENT TO BID FORM
(Construction Contract)

If a bid or modification to a bid based on unit prices is submitted and provides for a lump sum adjustment to the total estimated cost, the application of the lump sum adjustment to each unit price, including lump sum units, in the bid schedule must be stated or, if it is not stated, the bidder agrees that the lump sum adjustment shall be applied on a prorata basis to every unit price in the bid schedule.

In case of error in the extension of prices, the unit price will govern.

The bidder warrants that he has available or under his control plant of the character and in the amount required to complete the proposed work within the specified time.

It is hereby warranted that in the event award is made to the bidder, there will be furnished under this contract, or used in the performance of the work covered by this contract, only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States and only such manufactured articles, materials, and supplies as have been manufactured in the United States substantially all from articles, materials, or supplies mined, produced or manufactured, as the case may be, in the United States, except as noted below or otherwise indicated in this bid or authorized in the invitation.

Mistakes in Bids. - The bidder hereby waives that portion of any alleged mistake or mistakes in his bid as submitted which falls within the following amounts:

If bid is \$250,000 or less -- 5% of the bid;

If bid is more than \$250,000 and less than \$500,000 - \$12,500 plus 4% of the bid over \$250,000;

If bid is \$500,000 or more, and less than \$1,000,000 - \$22,500 plus 3% of the bid over \$500,000;

If bid is \$1,000,000 or more - \$37,500 plus 2% of the bid over \$1,000,000.

In cases where the allegation of mistake exceeds the above waived amounts and the request for correction is allowed, such amount will be excluded from the contract price; however, the amount waived as provided herein will not be deducted for the purpose of evaluating bids to determine the low bidder.

SUPPLEMENT TO BID FORM
(Construction Contract)

The above waiver does not apply to any clerical mistake which is obvious or apparent on the face of the bid including but not limited to (1) a mistake in the extension of a unit price or prices; (2) a mistake in totaling the sums of various bid items; (3) obviously misplaced decimal point or (4) failure to insert the unit price where amount intended can be determined from face of bid.

This clause is not applicable to allegations of mistakes which, if allowed, would result in a reduction in the bid price.

The following information is required and should be submitted with your bid if the amount of the bid exceeds \$10,000.00.

PARENT COMPANY AND EMPLOYER IDENTIFICATION NUMBER

(a) Bidder represents that he ☐ is, ☐ is not, owned or controlled by a parent company. For this purpose a parent company is defined as one which either owns or controls the activities and basic business policies of the bidder. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company such ownership is not required; if another company is able to formulate, determine or veto basic business policy decisions of the bidder such other company is considered the parent of the bidder. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements, or otherwise.

(b) If the bidder is owned or controlled by a parent company, insert in the space below, the name and main office address of the parent company.

| Name | Address |
|------|---------|
|------|---------|

(c) Bidder will provide in the applicable space below, if he has no parent company, his own Employer's Identification Number (E. I. No.) (Federal Social Security Identification Number used on Federal Tax Return) or, if he has a parent company, the E. I. No. of his parent company.

Bidder's E. I. No. _____

Parent Company's E. I. No. _____

CERTIFICATION OF NONCOLLUSION (NOV. 1963)

(a) By submission of this bid, the bidder certifies in connection with this procurement that:

- (1) the price in this bid has been independently arrived at without collusion with any other bidder or with any competitor;
- (2) unless otherwise required by law, the price in this bid has not been knowingly disclosed and will not be knowingly disclosed prior to opening, directly or indirectly to any other bidder or to any competitor; and
- (3) no attempt has been or will be made to induce any other person or firm to submit or not to submit a bid.

(b) The person signing this bid certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification.

(c) A bid will not be considered for award where (a)(1), (a)(3), or (b) above has been deleted or modified. Where (a)(2) above has been deleted or modified, the bid will not be considered for award unless the bidder furnishes with the bid a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that the disclosure was not made with collusive intent.

COMPLIANCE REPORTS RE NON-DISCRIMINATION CLAUSE
(Applicable to all contracts over \$10,000.)

The bidder represents that he () has, () has not, participated in a previous contract or subcontract subject to either the non-discrimination in employment clause herein or the clause originally contained in Section 301 of Executive Order 10925, that he () has, () has not, filed all required compliance reports; and that representations indicating submission of required compliance reports, signed by proposed subcontractors will be obtained prior to subcontract awards.

Bradway Dams - Upper & Lower



1926 Monson

Dams located easterly of East Hill Road off the Chicopee Brook.

| | |
|-----------|------------------------------|
| City/Town | Monson |
| Dam | Bradway Dams - Upper & Lower |
| Name | Bradway, C P |
| Name | C P Bradway Machine Works |
| Name | McGill |
| Streets | East Hill Road |
| Water | Chicopee Brook |

Page 43 of report.

C. P. Bradway

West Stafford, Conn.

you are notified that your lower
dam, located on Chiefess Brook as called in the Town of
Monson, etc.

"The penstock, headgates, flume,
spillway, etc. are broken down and the
debris formed heaped up in the bed of the
brook. This should be removed in order
to make a free waterway for the brook."

Now, therefore, etc.

March 3, 1926

C. P. Bradway,
West Stafford, Conn.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your upper dam, located on Chicopee Brook, so-called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam requires repairs, especially the overflow or spillway located at the north end of the dam. This should be rebuilt and the top of the dam raised at least two and one-half or three feet above the crest of the spillway in order that intense flood flows may not top the structure and thus destroy it."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

March 3, 1926

C. P. Bradway,
West Stafford, Conn.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your lower dam, located on Chicopee Brook, so-called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The penstock, headgates, flume, spillway, etc. are broken down and the debris formed heaped up in the bed of the brook. This should be removed in order to make a free waterway for the brook."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

March 10, 1926

Mr. James L. Tighe,
189 High Street,
Holyoke, Mass.

Dear Mr. Tighe:

Enclosed herewith are copies of letters
we have received which are self-explanatory.

In regard to Mr. Bradway's letter, will
you kindly advise the County Commissioners what their
next step would be, also, kindly render your opinion
in regard to Mr. Palmenberg's letter.

The letter from Mr. Williams, we could
not seem to connect with the dams listed in the report.
Kindly advise us in regard to this.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

C/N
3 Enc.

March 10, 1926

Mr. C. P. Bradway,
The C. P. Bradway Machine Works,
West Stafford, Conn.

Dear Sir:

This will acknowledge receipt of your
letter of March 5, 1926.

The County Commissioners thank you for
explaining the building of the dam to them. We
have referred your letter to our Engineer and upon
receipt of word from him, we will advise you in re-
gard to the matter.

Enclosed herewith are copies of the law
which you requested.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

C/H
Enc.

March 19, 1926

Mr. C. P. Bradway,
The C. P. Bradway Machine Works,
West Stafford, Conn.

Dear Sir:

We are enclosing herewith copy of reply
of Mr. James L. Tighe, Engineer, relative to your
dams, and it is ordered that the contents of same
be carried out.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

GSC/N
Enc.

April 26, 1933.

Mr. C. P. Bradway,
West Stafford,
Connecticut.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your upper dam, located on Chicopee Brook so called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"There is a low place in the top of the embankment north of the sluice gate that should be filled and leveled up. The overflow is partly obstructed by a growth of brush and weeds which should be cut down and cleared away. There is also considerable debris, logs, etc., in front of the overflow which should be removed. The pond should be drawn down at least two feet and kept down until the repairs mentioned above have been made."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Oct. 5, 1960

Mr. O. E. Bradway
East Hill Rd.
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et. seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located easterly of East Hill Rd. has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam was found to be in satisfactory condition. The embankment is in fairly good shape. Side slopes are rough, however, but this is apparently the result of cattle walking along the side slopes. The spillway inlet baffle of asphalt coated corrugated iron is showing signs of rusting after only about one year of use. This condition is occurring at about the water line. Maintenance should be done to prevent deterioration of this baffle. An asphalt paint could be applied to the metal.

The swale spillway should be provided with a better growth of grass and sod. Also, it appears as if the right side of the swale spillway, where there is no growth of sod whatsoever, the elevation of the ground is not quite high enough to protect the toe of the embankment from spillage of storm overflow passing thru the swale. This condition should be corrected as needed."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

SAMUEL B. MAGILL

TRAINING CONSULTANT

901 69TH AVENUE N. • PHILADELPHIA 19126

November 18, 1969

Board of County Commissioners
County of Hampden
52 State Street
Springfield, Massachusetts 01103

Gentlemen:

Your letter of October 22 referring to the Bradway Dam has been received.

This dam was built in the late nineteenth century by C. P. Bradway, a noted hydraulic engineer who is the subject of a monograph by the Smithsonian Institution for his pioneering contributions to water-power development.

As the present owner of the Bradway estate I make it a point to inspect this dam frequently. I also have a resident representative, Ashley Burnham, who keeps an eye on it.

I agree that the trees which have taken root in the dam are a hazard and assure you that they will be removed in accordance with your recommendations.

Thank you for bringing this matter to my attention. I appreciate your offer of technical advice.

Sincerely,

Samuel B Magill.

Depace Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|------------|
| City/Town | Monson |
| Dam | Depace Dam |
| Name | Depace |

MONSON
D13014

DEPACE DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Mace Dam



1945 Monson

Located on Twelve Mile Brook.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Mace Dam |
| Name | Mace, C H |
| Water | Twelve Mile Brook |

October 3, 1945

Dr. C. H. Mace
612 Westfield Street
West Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on 12 Mile Brook in the town of Monson has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"There is a leakage in this dry stone masonry structure, near its north abutment, apparently at a point about 3 feet below its crest which should be repaired."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____ Chairman

Pulpit Rock Pond Dam (Lower) aka Bugbee Dam



1950 Monson

Also see: Pulpit Rock Lake Dams.

| | |
|-----------|------------------------------|
| City/Town | Monson |
| Dam | Pulpit Rock Pond Dam (Lower) |
| Dam | Bugbee Dam |
| Name | Bugbee, E D |

September 20, 1950

E. D. Bugbee
208 Longhill Street
Springfield, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your lower dam located in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"The small sloping concrete trough spillway at the most northerly end of the pond has disintegrated, and is leaking badly along the sides and the base. This spillway should be repaired."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

*Pulpit Rock Pond Lower Dam
Monson*

Graves Dam



1941 Monson

Dam located on Calkins Brook.

| | |
|-----------|---------------|
| City/Town | Monson |
| Dam | Graves Dam |
| Name | Graves, E L |
| Water | Calkins Brook |

Mr. E. L. Graves

August 27, 1941

Monsen, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby notified that your dam on Calkins Brook in Monsen has been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This structure is in fair condition but the swale channel constructed some years ago at its east end has been filled in. This swale, or auxiliary spillway, should be reopened and put in its former condition."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

Paradise Lake Dam aka Eaton Dam



1933 Monson

Dam located on Paradise Lake. Also see: Paradise Lake Dam aka Eaton, G C, Dam.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Paradise Lake Dam |
| Dam | Eaton Dam |
| Name | Eaton, G C |
| Water | Paradise Lake |

April 26, 1933

Mr. G. C. Eaton,
75 Pomona Street,
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Sullivan Brook, so called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"There is only a small clearance between the crest of the spillway and the top of the dam. To increase its safety against being topped by flood flows, the embankment should be raised to a height of at least two feet above the crest of the overflow. If it is not thought advisable to raise the embankment, then the crest of the spillway should be lowered to a depth of two feet below the top of the dam. In either case the spillway should be cleared and kept clear of all earth, debris, etc."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____

Chairman.

67
November 14, 1951

G. C. Eaton
726 Belmont Avenue
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Paradise Lake in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"A partly blocked screen was found on the spillway in front of the spillway channel. This screen should be removed during the Winter and Spring seasons or a proper screen structure should be built to provide for year-round use."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

MC Eaton - Paradise Lake

11-14-51

December 3, 1952

Mr. G.C. Eaton
726 Belmont Avenue
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Paradise Lake in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Some of the stone slabs laid across the spillway channel have broken and fallen into the spillway channel. These should be cleaned out of the spillway channel to provide a free opening. The pond at present is drawn down but the drawoff pipe is not big enough to act as a spillway by itself."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman

Paradise Lake Dam, Monson

Bumstead Dam



1926 Monson

Located on a tributary to Chicopee Brook

| | |
|-----------|------------------|
| City/Town | Monson |
| Dam | Bumstead Dam |
| Name | Bumstead, Horace |
| Water | Chicopee Brook |

Page 43 of report.

Horace Burnstead,

Monson, Mass.

you are notified that your dam,
located on a tributary to Chicopee Brook as called
in the Town of Monson, etc.

"The dam is in fair condition, but
notwithstanding, it is recommended that
its top be raised at least two feet above
the crest of the spillway."

April 28, 1926

Mr. Horace Bumstead,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 534 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on a tributary to Chicopee Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in fair condition, but notwithstanding, it is recommended that its top be raised at least two feet above the crest of the spillway."

Yours very truly,

COUNTY COMMISSIONERS

Chairman

Burdick Dam



1926 Monson

Located on Sullivan Brook.

| | |
|-----------|------------------|
| City/Town | Monson |
| Dam | Burdick Dam |
| Name | Burdick, James J |
| Water | Sullivan Brook |

Page 45 of report

James G. Bundick,
Monson, Mass.

you are notified that your
dam, located on Sullivan Brook as called in the
Town of Monson, etc.

"The dam is in fair condition
except at the south end of the spillway
where the stone work requires re-setting
and pointing. Some repairs are also
necessary around the penstock."

April 28, 1926

Mr. James J. Burdick,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Sullivan Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in fair condition except at the south end of the spillway where the stone work requires re-setting and pointing. Some repairs are also necessary around the penstock."

Yours very truly,

COUNTY COMMISSIONERS

Chairman.

Calkins Dam



1926 Monson

Ice pond dam located on a tributary to Chicopee Brook.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Calkins Dam |
| Name | Calkins, Judson R. |
| Water | Chicopee Brook |

Page 44 of report

Judson R. Calkins,

Monson, Mass.

"you are notified that your we
pond dam, located on a tributary to Chequamegon Brook
as called in the Town of Monson, etc.

Outside the spillway, the dam is in
poor condition and its height in some places
is very little above the crest of the spillway.
The wonder is that it hasn't been washed
away long ago. The part abutting the east
corner of the spillway is in a state of
rupture and part of the stonework has
fallen out of place. Because of the large
size of the pond, it is recommended
that the structure be put in condition or
else the pond drawn down, as soon or
late, the structure, if not repaired, will
fail.

now, therefore, etc.

March 3, 1926

Judson R. Calkins,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your ice pond dam, located on a tributary to Chicopee Brook, so-called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

Outside the spillway, the dam is in poor condition and its height in some places is very little above the crest of the spillway. The wonder is that it hasn't been washed away long ago. The part abutting the east corner of the spillway is in a state of rupture and part of the stonework has fallen out of place. Because of the large size of the pond, it is recommended that the structure be put in condition or else the pond drawn down, as sooner or later, the structure, if not repaired, will fail.

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Judson R. Calkins,
Monson, Mass.

Nov - 1926

Dear Sir:

A notification was sent to you on March 10th last relative to the condition of your dam, a copy of which is hereto attached.

Inasmuch as your dam was inspected again quite recently by our engineer and that he found that no repairs had as yet been made on the structure, your attention is called to Sections 47 and 48 of Chapter 253 of the General Laws as amended by Sections 3 and 4 of Chapter 178 of the Acts of 1924, which are as follows:

Section 47. "If after notice in writing to the owner of a reservoir or dam which has been so examined and adjudged to be unsafe, the said owner refuses or neglects to make such alterations or repairs as the commissioners order, they may, at the expense of the county, cause such reservoir or dam to be altered and repaired or any part thereof removed or the water drawn off, whichever they may consider necessary for the safety of life, property, roads or bridges on the stream below. After such removal, no structure shall be erected except in compliance with the three preceding sections, and after the water has been drawn off, the reservoir shall not be filled again until the orders of the commissioners have been complied with."

Section 48. "The Commissioners shall make such orders as they may deem just as to the payment by the owner, county or other party of the costs and expenses incurred by them under the three preceding sections, and if the reservoir or dam was adjudged to be unsafe, said costs and expenses may be ordered paid by the owner, with interest, from the time they were paid by the county. Notice shall be given the County Treasurer and the owner or other party of the amount due the county."

If the order of the commissioners is not complied with, the commissioners will be forced to proceed in the manner above authorized.

Yours very truly,

COUNTY COMMISSIONERS.

By _____
Chairman.

November 17, 1926

Judson R. Calkins,
Monson, Mass.

Dear Sir:

A notification was sent to you on March 10th last relative to the condition of your dam, a copy of which is hereto attached.

Inasmuch as your dam was inspected again quite recently by our engineer and that he found that no repairs had as yet been made on the structure, your attention is called to Sections 47 and 48 of Chapter 253 of the General Laws as amended by Sections 3 and 4 of Chapter 178 of the Acts of 1924, which are as follows:

Section 47. "If after notice in writing to the owner of a reservoir or dam which has been so examined and adjudged to be unsafe, the said owner refuses or neglects to make such alterations or repairs as the commissioners order, they may, at the expense of the county, cause such reservoir or dam to be altered and repaired or any part thereof removed or the water drawn off, whichever they may consider necessary for the safety of life, property, roads or bridges on the stream below. After such removal, no structure shall be erected except in compliance with the three preceding sections, and after the water has been drawn off, the reservoir shall not be filled again until the orders of the commissioners have been complied with."

Section 48. "The Commissioners shall make such orders as they may deem just as to the payment by the owner, county or other party of the costs and expenses incurred by them under the three preceding sections, and if the reservoir or dam was adjudged to be unsafe, said costs and expenses may be ordered paid by the owner, with interest, from the time they

November 17, 1926

Judson R. Calkins - 2

were paid by the county. Notice shall be given the County Treasurer and the owner or other party of the amount due the county."

If the order of the commissioners is not complied with, the commissioners will be forced to proceed in the manner above authorized.

Yours very truly,

COUNTY COMMISSIONERS

By _____ Chairman

November 29, 1926

Mr. Judson Calkins,
Monson, Mass.

Dear Mr. Calkins:

This is to notify you that the
County Commissioners and their Engineer, Mr. James
L. Tighe will be out to see your dam on Wednesday,
December 1st at 9:30 A. M. to go over the matter
which you came in to see the Commissioners about
last Wednesday.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

C/N

April 26, 1933

Mr. Judson R. Calkins,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on a tributary of Chicopee Brook in the Town of Monson, has been inspected by our engineer and your attention is called to the following condition noted and recommendation made by him;

"There is not sufficient freeboard on this dam to insure against its being topped by flood flows. It is therefore recommended that the entire top of the embankment be raised to a level of two (2) feet above the crest of the overflow."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendation be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

December 5, 1947

Mr. J. R. Calkins
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the dam belonging to you and located on a tributary of Chicopee Brook in Monson has been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"In a recent inspection made of the J. R. Calkins dam located on a tributary of Chicopee Brook in Monson, it was found that trees are growing in the down stream face of the dam causing leakage of the structure which may result in the failure of the dam. These trees should be cut down and the stumps and roots grubbed out of the structure."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By Charles W. Bray
Chairman

William Dwight

Thomas F. Sullivan

Ingraham Dam



1950 Monson

Small dam and pond on Maxwell Brook, Chicopee Brook.

| | |
|-----------|-----------------|
| City/Town | Monson |
| Dam | Ingraham Dam |
| Name | Ingraham, James |
| Name | Calkins, George |
| Water | Maxwell Brook |
| Water | Chicopee Brook |

JAMES L. TIGHE
PHILIP E. BOND

TELEPHONE
HOLYOKE 5525

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
WATER POWER
DAMS

May 2, 1950

The Hon. The Board of County Comm'rs.
Hampden County Court House
Springfield, Mass.

Gentlemen:

Enclosed, for your information and files, is
a copy of a letter sent to Mr. Ingraham per-
taining to a request for information concerning
the construction of a small dam and pond on
Maxwell Brook in Monson.

Very truly yours,


E. H. McDonnell
County Hydraulic Engineer

May 2, 1950

Mr. James Ingraham
Silver Street
Monson, Mass.

Dear Sir:

I have made an investigation of the size of the drainage area of Maxwell Brook, at the site of the proposed dam and pond that we inspected on Saturday afternoon, April 30, 1950.

The drainage area behind the proposed dam is approximately 1.05 square miles, and thus any pond and dam to be constructed at the point indicated by you on Maxwell Brook would come under County jurisdiction.

Before doing any construction which would impound water of Maxwell Brook, you should prepare plans and a written specification of the proposed work, and these, together with a petition for permission to do the work and the necessary fee of \$3.00 for filing of the plans and specifications, should be forwarded to the County Commissioners, Hampden County Court House, Springfield, Mass. The plans and specifications will be reviewed and, if found satisfactory, will be approved, and permission to proceed with construction will be given.

If you have any question pertaining to the proposed construction or the filing of the petition, kindly call me at Holyoke 5525.

Very truly yours,

By

G. H. McDonnell
County Hydraulic Engineer



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~Ralph P. Walsh~~

Floyd W. Fradet

Stephen A. Moynahan

October 22, 1969

Mr. George Calkins
Palmer Lower Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook, upstream from the Church Manufacturing Company dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is still in very poor condition. The stone block masonry forming a portion of the left and the right sections of the dam is in fair to poor condition. Stone block masonry of the right section located adjacent to the central concreted stone masonry portion of the dam is in poor condition and some of the stone blocks are no longer supported since underlying blocks have been washed away.

The abutment area to the right of the dam is in poor condition and large trees are growing from the abutment. Loss of any of these large trees by uprooting, as a result of wind action, could cause a breach of the abutment and loss of the stored water.

The left abutment is in poor condition. The old turbine pit passes water thru the structure via the inlet rack and missing planks on the downstream side.

In the opinion of the undersigned this dam could fail in the not too distant future. However, failure of the structure would not

release a great deal of water downstream. The bottom of the pond is, in general, only from 1 ft. to 2 ft. below the crest of the dam. In fact, at the present time much of the pond area is now an island overgrown with weeds and miscellaneous vegetation. The quantity of water stored behind the dam is negligible.

If failure of this dam should occur during flood flow conditions, the failure would not be observed as a wave of water moving downstream. Any increase in flow from released water would be but a very small percentage of the flood flow quantity.

The new owner of the dam should be advised of its condition. He should either make the dam safe by doing the necessary maintenance and reconstruction work or he should breach the structure by removing a major portion of the masonry dam from the stream bed.

Though in the opinion of the undersigned, the dam will probably fail in the not too distant future, it will not cause any flooding of consequence downstream. The only danger would be to persons who may be in the stream bed directly below the dam at the time of failure. "

It is the feeling of this Board that you should either make the dam safe by doing the necessary maintenance and reconstruction work, or, if you have no further use for the dam, the structure should be breached by removing a major portion of the masonry dam from the stream bed.

Will you kindly let our Board know whether or not you plan to maintain the dam and if so, when it can be expected that the necessary repairs and maintenance will be accomplished.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

release a great deal of water downstream. The bottom of the pond is, in general, only from 1 ft. to 2 ft. below the crest of the dam. In fact, at the present time much of the pond area is now an island overgrown with weeds and miscellaneous vegetation. The quantity of water stored behind the dam is negligible.

If failure of this dam should occur during flood flow conditions, the failure would not be observed as a wave of water moving downstream. Any increase in flow from released water would be but a very small percentage of the flood flow quantity.

The new owner of the dam should be advised of its condition. He should either make the dam safe by doing the necessary maintenance and reconstruction work or he should breach the structure by removing a major portion of the masonry dam from the stream bed.

Though in the opinion of the undersigned, the dam will probably fail in the not too distant future, it will not cause any flooding of consequence downstream. The only danger would be to persons who may be in the stream bed directly below the dam at the time of failure. "

It is the feeling of this Board that you should either make the dam safe by doing the necessary maintenance and reconstruction work, or, if you have no further use for the dam, the structure should be breached by removing a major portion of the masonry dam from the stream bed.

Will you kindly let our Board know whether or not you plan to maintain the dam and if so, when it can be expected that the necessary repairs and maintenance will be accomplished.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Silver Lake Dams - Upper & Lower



1926 Monson

Dams located on Twelve Mile Brook relative to Baldwin Pond & Freitag Pond. See also: County Highways (Monson) - "Silver Street Upper & Lower Dams".

| | |
|-----------|---------------------------------|
| City/Town | Monson |
| Dam | Silver Lake Dam - Upper & Lower |
| Name | Baldwin, R A |
| Name | Sanderson |
| Name | J E Shepard Company |
| Streets | Reimer Road |
| Water | Twelve Mile Brook |
| Water | Baldwin Pond |
| Water | Freitag Pond |

April 6, 1926

Dr. R. A. Baldwin,
162 Long Hill St.,
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your upper or Silver Lake dam, located on Twelve Mile Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him:

"The dam requires some repairs,
as the stone work of the crest is loose, out
of place, and should be reset in mortar."

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

Page 47 of report

Dr. R.A. Baldwin,
162 Long Hill St,
Springfield, Mass.

you are notified that your
or Silver Lake upper dam, located on Twelve Mile Brook or called
in the Town of Manson, etc.

"The dam requires some repairs,
as the stone work of the crest is loose, out
of place, and should be reset in mortar.

CD Monson
Feb. 19, 1960

J. E. Shepard Company
37 Main Street
So. Windsor, Conn.

Att: J. E. Shepard

Gentlemen:

It has come to my attention that you apparently have acquired property in Monson that includes two dams and ponds carried in the records of Hampden County as the Baldwin property. The ponds are on Twelve Mile Brook and on the topographical sheet the lower Pond is listed as Baldwin Pond and the upper pond is listed as Freitag Pond. These ponds have apparently recently been owned by Dr. Sanderson.

The undersigned is writing to you as County Hydraulic Engineer for the County of Hampden, Mass. I am enclosing herewith, for your information and file purposes, a copy of certain sections of the laws having to do with dams and ponds in the State of Massachusetts.

Both of the dams hereinbefore mentioned come under the jurisdiction of the County Commissioners. Consequently, any work planned in connection with either of the ponds or dams should be cleared thru the Board of County Commissioners, Hampden County Court House, 37 Elm St., Springfield, Mass.

The upper dam has been acceptable to the County, though it is in a somewhat dilapidated state, because of the fact that there has been no pond behind the dam. Loss of the dam in time of flood would simply eliminate the waterfall in Twelve Mile Brook. No stored water of any quantity would be released.

At the lower dam, the County has recommended to the previous owner that the spillway capacity be increased. Stop logs located in the spillway slot have been directed removed and kept out of the slot until proper spillway capacity has been provided.

CD Monson
Feb. 19, 1960

Before you proceed with any planned construction or changes at these dams, it would be well to submit to the County Commissioners an outline of any proposed changes planned. Also, the undersigned would be pleased to meet with you at the site of the dams, if you so desire, to discuss any planned work and the need for increased spillway capacity at the lower dam.

Very truly yours

GHM/cmb

George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
Feb. 19, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm St.
Springfield, Mass.

Gentlemen:

I have just received a telephone call from the Conservation Service in West Springfield that a Mr. Shepard of Connecticut has contacted them about proceeding immediately with certain changes to two dams and ponds recently acquired by him and located in Monson. The Conservation Service will advise Mr. Shepard that he should acquaint himself with the requirements of the County in connection with changes to dams and ponds.

I have been informed that Mr. Shepard plans to start construction and certain changes to the ponds within a matter of a week or two. Rather than see him proceed to do things that may not be acceptable to your Board, I have written to Mr. Shepard, sent him a copy of Chapter 253 of the General Laws, Section 44 thru 50, and outlined certain minimum needs, particularly at the lower dam.

A copy of my communication to Mr. Shepard is enclosed herewith.
Its contents are self-explanatory.

Very truly yours,

County Hydraulic Engineer


George H. McDonnell

Oct. 5, 1960

J. E. Shepard Company
37 Main Street
So. Windsor, Conn.

Att: J. E. Shepard

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your lower dam, located at Baldwin Pond off of Reimer Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Increased spillway capacity should be provided at this structure as previously recommended. Until the spillway capacity is increased, the top two stop logs in the spillway notch should be removed and kept out of the spillway so that at least a 24-inch deep notch will always be available for the passage of flood flows. All stop logs should be removed from the spillway thru the Fall and Spring months, until after the Spring flood flows. The Owner should be directed to increase the capacity of the spillway or abandon the pond."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

The J. E. Shepard Co.
HOME OF CONNECTICUT BROADLEAF TOBACCO
GROWER AND PACKER
SOUTH WINDSOR, CONN.

October 13th, 1960

Mr. William F. Stapleton
Office of The County Commissioners
37 Elm Street
Springfield, Massachusetts

Dear Mr. Stapleton:

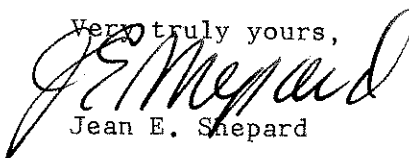
Yours of October 5th received. I am sorry I have not had a chance to acknowledge your letter before this date, but I have been out of state this past week.

As you realize, this dam and pond situation are very important to me as well as to yourselves. The property, I feel, is a valuable piece of land as long as I can maintain the pond. However, I do agree there has to be certain work done on the dam to avoid any damage to property below my parcel.

I have contacted Eastern Gunit Corporation and we are going to contract with them to strengthen and resurface the spillway in order that it may be in first class condition with spillway boards which would require little effort to remove in case of emergency.

I also realize that going by the book, we have a large watershed and so many gallons per second must be released. I would appreciate it greatly, if at your convenience, I could meet with Tom Sullivan, Ralph Walsh and yourself at the site, in hopes that we may have a meeting of the minds as to what must be done at this time.

Very truly yours,



Jean E. Shepard

JES:cjp

Copy of this letter sent to George H. McDonnell,
County Hydraulic Engineer, on October 20, 1960.

CD Monson
Oct. 31, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

I have reviewed the copy of the communication sent by the J. E. Shepard Company and signed by Jean E. Shepard pertaining to the dam situated in Monson.

I have met with Mr. Shepard and members of the United States Department of Agriculture, Soil Conservation Service, relative to the design and installation of additional spillway capacity. Engineering personnel from the Soil Conservation Service have been here to my office and have reviewed the preliminary design of spillway facilities being planned for the dam.

I was of the understanding that the additional spillway facilities would be constructed shortly.

In the third paragraph of the letter from Jean E. Shepard, it would appear that the owner is planning to have a gunite company resurface the existing spillway to put it in first class condition and to include flashboards designed to be easily removed.

The existing spillway does not have sufficient capacity in itself to pass anticipated flood flows. Consequently, additional spillway capacity should be provided. The need for this added spillway capacity, in my opinion, is far more important than the need for maintenance and changing of spillway flashboards on the existing spillway unit.

If you wish me to take any action in connection with the request of Jean Shepard, I will be pleased to do so.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

CD Monson
Oct. 31, 1960

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

I have reviewed the copy of the communication sent by the J. E. Shepard Company and signed by Jean E. Shepard pertaining to the dam situated in Monson.

I have met with Mr. Shepard and members of the United States Department of Agriculture, Soil Conservation Service, relative to the design and installation of additional spillway capacity. Engineering personnel from the Soil Conservation Service have been here to my office and have reviewed the preliminary design of spillway facilities being planned for the dam.


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If you wish me to take any action in connection with the request of Jean Shepard, I will be pleased to do so.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

Nov. 16, 1960

J. E. Shepard Co.,
So. Windsor, Conn.

Att: Jean E. Shepard

Dear Mr. Shepard:

Reference is made to your communication of Oct. 13, 1960, addressed to Commissioner Stapleton and in reference to the dam you own, in the Town of Monson.

The County Hydraulic Engineer has reported to us that the spillway capacity of this dam should be increased and that a conference was held in connection therewith sometime ago, at the site in Monson, wherein needed improvements to the dam were discussed by you, the County Hydraulic Engineer and engineering representatives of the Soil Conservation Service. A later conference was held between the County Hydraulic Engineer and Soil Conservation engineering personnel regarding the design of additional spillway capacity thru the construction of tubes under and across the roadway.

The matter involved is one of hydraulics and engineering. Consequently, our Board will be guided by the advice of the County Hydraulic Engineer regarding needed spillway capacity at the dam. It is recommended that you or your designing engineer meet with the County Hydraulic Engineer to be certain that any changes and improvements at the dam are being done in accordance with present day standards and that plans, as well as specifications, of any proposed changes be prepared and filed with the County, in advance of any changes or construction work being done in the field.

As existing, the present spillway will not be adequate to meet the needs for passing flood flows. Thus, it would be advisable to review proposed work, as outlined in paragraph three of your letter of Oct. 13, 1960, with the County Hydraulic Engineer before proceeding with any work on the present spillway.

The County Hydraulic Engineer may be reached by calling

Holyoke, JE-33991 or writing to him at Bowers & Pequot Streets, Holyoke, Mass. The County Hydraulic Engineer is Mr. George H. McDonnell, whom you have already met.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

By _____

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

***TIGHE
& BOND***

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
Nov. 15, 1960


The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Enclosed, for your information and consideration, is a communication to be forwarded to Jean E. Shepard, of the J. E. Shepard Co., So. Windsor, Conn., in answer to the Shepard letter of Oct. 13, 1960.

If, after reviewing the communication, you agree with its contents, the letter should be signed and forwarded.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

GHM/cmb
enc.

CD Monson
Nov. 28, 1960

Shepard Tobacco Co.
5a Windsor, Conn.

Att: Mr. Jean Shepard

Gentlemen:

I was not in the office this past weekend and when I checked my desk on Sunday I noted that you had called Saturday morning requesting that I contact you at LYric 6-6079. I also noted that you planned to leave for Florida on Sunday and would not return for a week.

I am sorry that you didn't contact me on Friday, for had I known you were going to be in the Monson area, I might have been able to arrange a conference with you.

If you wish to meet with me in connection with the alterations and repairs to your dam in Monson, please let me know in advance when you will again be in the area. I will be pleased to arrange my schedule to meet you at the site of the work.

My last discussion with the conservation personnel indicated that you planned to install additional spillway capacity thru the construction of tubes under and across the highway. These tubes were to have a concrete masonry inlet structure. Do you still plan this construction or is a revision of the needed spillway capacity to be presented for our review.

Since you will apparently be in Florida thru Dec. 4, as per the information left on my desk, I will plan to hear from you some time during the middle or latter part of next week.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
Dec. 14, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

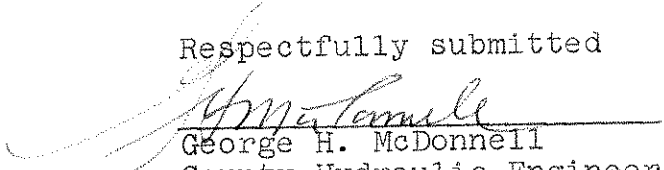
On Dec. 6, 1960, the undersigned met with Mr. Jean Shepard at the site of his dam in Monson, for the purpose of discussing further the need for additional spillway capacity. Mr. Shepard had construction personnel at the site of the dam and on that day work of restoring the concrete at the existing spillway was to begin. All eroded and washed-out concrete surfaces were to be replaced and the existing spillway improved.

The undersigned pointed out to Mr. Shepard that the work, as planned, was good insofar as it had to do with the existing spillway capacity. However, it was also pointed out that additional spillway capacity could only be accomplished by the construction of new spillway facilities or the widening of the existing spillway. New spillway facilities seemed to be the most desirable and the least costly.

As a result of our conversation, Mr. Shepard agreed to investigate methods for obtaining additional spillway capacity and to have a design of an additional spillway prepared for submission to your Board for review and approval. The undersigned urged that this work be accomplished at an early date so that the pond formed by the dam could be maintained at full level in the coming year.

Respectfully submitted

GHM/cmb


George H. McDonnell
County Hydraulic Engineer

CD Monson
Dec. 14, 1960

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

On Dec. 6, 1960, the undersigned met with Mr. Jean Shepard at the site of his dam in Monson, for the purpose of discussing further the need for additional spillway capacity. Mr. Shepard had construction personnel at the site of the dam and on that day work of restoring the concrete at the existing spillway was to begin. All eroded and washed-out concrete surfaces were to be replaced and the existing spillway improved.

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Respectfully submitted

GHM/cmb

George H. McDonnell
County Hydraulic Engineer

C. D. Monson
May 24, 1961

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

I have reviewed a set of plans containing two sheets entitled "Plan and Profile of Reimers Road-Monson, Mass., for J. E. Shepard", dated April 12, 1961 and filed May 22, 1961, With the two sheets of plans are specifications consisting of a title page and two pages of descriptive material. The specifications are entitled "Construction Specifications for emergency overflow spillway area on Reimers Road, Monson, Mass. for J. E. Shepard, South Windsor, Conn." The specifications are dated April 30, 1961.

The proposed work, as set forth on the plans and described in the specifications consists of converting the embankment on Reimers Road just in front of the pond owned by J. E. Shepard, into an emergency overflow spillway. The pond owned by Mr. Shepard is on 12-mile Brook upstream from Pulpit Rock Lake. The spillway serving the pond for many years is a masonry overflow unit too small in capacity to handle major storm runoff conditions. Structurally the old spillway is in satisfactory condition. Recently the owner had repairs made to the spillway by installing a coat of Gunitite over the eroded and worn section of the masonry.

The embankment carrying the roadway of Reimers Road serves to dam the brook course, to form the pond owned by Mr. Shepard and causes the overflowing water to pass under and across the Reimers Road spillway bridge through the existing old masonry spillway structure.

In the flood of 1955 when the capacity of the spillway was exceeded by the flow of the brook, the embankment carrying Reimers Road was washed out. The embankment was replaced shortly after the flood for the purpose of restoring traffic flow on Reimers Road. The embankment had never been built in accordance with

C. D. Monson
May 24, 1961

dam construction specifications nor had it been built in such a way to increase spillway capacity.

The plans and specifications propose the lowering and regrading of the embankment for a distance of about 100 ft. to provide a planned wide notch through which and over which excess runoff can pass in time of extreme storm conditions. The gravel road of the embankment is to be paved with 6" of bituminous concrete and the upstream edge of this bituminous coating is to extend 5 ft. into the embankment to act as a cutoff wall to prevent excess seepage from undermining the bituminous concrete pavement. The upstream face of the embankment is to be sealed with 12 inches of impervious material over which loam and seed will be placed.

The downstream face of the embankment consisting of ordinary sandy fill at a fairly steep grade is to be flattened out on a slope of about 2.5 horizontal to 1 vertical. Onto the face of the embankment is to be placed a 12 inch gravel layer and then on top of this layer of gravel will be placed two layers of heavy stone riprap.

The first or bottom of these two layers shall consist of stone weighing from 10 to 50 lbs. per piece and will be placed by mechanical means. The final or top layer shall consist of stone weighing from at least 150 lbs. to 400 lbs. and each piece shall be placed by hand with individual pieces to nest as close as is practical. Stone in the top layer shall have a minimum thickness of 15 inches. Chinking of the riprap may be required, depending upon the workmanship of the hand placed pieces.

All crevices of both layers of riprap shall be filled with concrete grouting of a texture as approved by the Engineer.

The work as proposed on the plans and in the set of specifications will provide a strong and good embankment which can be used for emergency overflow purposes.

It is my understanding that the work as proposed has been discussed with the officials of the Highway Dept. of the Town of Monson and that these officials concur in the work to be done, including the regrading and permanent paving of Reimers Road, as well as the raising and improving of the spillway bridge carrying Reimers Road over the spillway channel.

3
C. D. Monson
May 24, 1961

On the assumption that the work will be done in accordance with the two sheets of plans and the set of specifications filed on May 22, 1961, it is recommended that the plans and specifications as filed be approved.

Respectfully submitted,

George H. McDonnell
County Hydraulic Engineer

GHM:mh
Encl.

Oct. 25, 1961

J. E. Shepard Company
37 Main Street
So. Windsor, Conn.

Att: Mr. J. E. Shepard

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your lower dam, located at Baldwin Pond off of Reimer Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Lower Dam This dam was found to be in very good condition. The old spillway has been repaired with gunite and stop-logs were found to be in place at the level of the top of the concrete wall. Whereas this condition was not recommended in the past, because of improvements to the dam and an increase in the spillway capacity, the maintenance of the flashboards to this high level is now satisfactory. The emergency spillway construction at the road on the dam embankment was found to be in good condition. No seepage of any consequence was noted at the toe of the new grouted stone spillway chute.

At certain locations in the grouted stone paving there are voids which should be opened and then packed with grout. A close examination of the surface of the paving will indicate the location of most voids.

It was noted that eleven stones had been placed along the edge of the pond at the new paved roadway emergency spillway in the area of the spillway crest. These stones have been placed there apparently to protect traffic from going into the pond. However, these stones will act to greatly reduce the spillway capacity in time of extreme storm flow. These stones, especially the first thru the sixth large stone, counting from the driveway towards the spillway should be removed and replaced with thin guard posts or some other protective device that will not reduce the spillway capacity in the manner caused by the stones. "

As reported by the County Hydraulic Engineer, the placing of the large protective stones along the edge of the roadway reduces to a great extent the carrying capacity of the emergency spillway you have recently constructed. It would seem more desirable to provide a guard fence or structure of a type which would reduce to a minimum any interference with the flow of water over the spillway. A cable type fence with thin posts widely separated would greatly improve conditions as they now exist and still provide a measure of safety for highway traffic. It might also be possible to install a rustic type wooden guard rail to do the same work of protecting traffic.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

CD Monson
April 4, 1963

The J. Shepard Company
South Windsor, Connecticut

Att: Mr. Jean E. Shepard

Dear Mr. Shepard:

Reference is made to your dam located on your property at Reimer Road in the Town of Monson, Massachusetts. This is the dam adjacent to and part of Reimer Road itself, where the swale spillway was constructed in the recent past and the old spillway covered with a coat of gunite.

Our office received a call that settlement had taken place in the embankment of the dam adjacent to an abutment of the roadway bridge that also forms the sidewall of the original spillway at the structure.

The undersigned inspected the dam immediately on being notified of the condition and found that the embankment had settled for a width of about 5 ft. more or less parallel to the spillway and bridge wall extending from the edge of the water to a point about two-thirds across the paved roadway. I understand that the settlement became great enough so that the Highway Department had to place fill in the void in order to keep the roadway open. As now existing, the void has been filled to grade with a sandy material. However, a small amount of settlement has continued to take place and this is noticeable to the eye as a depressed area and cracks in the earth embankment adjacent to the settled area.

It is rather difficult to determine just why the settlement took place, but I suspect that it occurred at a time when water level in storage was high during the heavy rate of run-off resulting from melting snow during the past week. Water apparently seeped through the embankment and found its way out of the embankment thru openings in the sidewall of the spillway that also supports the bridge. In flowing thru the openings in this masonry wall, the water probably carried the fine grains of earth that make up the embankment and thus as a void formed in

the fill of the dam, the surface settled and the paved roadway collapsed. I have made a careful examination of the sidewall abutment but do not note the presence of any grains of the material in the voids of the spillway. Flow of water under the bridge is so heavy that it is not possible at the present to get right under the bridge for a close examination of the masonry wall. It is possible that the seepage passed directly thru the dam but this I doubt since there is no evidence at the toe of the dam of any fines being washed thru or any break in the embankment.

In the pond at the upper face of the embankment and just below water level at a point where the settlement terminates, I note the presence of what appears to be a pillow or cushion together with other miscellaneous material. It is possible that someone noted a swirl of water and the formation of a small piping type void at this point and attempted to plug it with these materials. Again, the presence of these materials at the settled area may be just coincidence. In any event, I feel that the settlement has been the result of water flowing into the embankment and emerging at some point, probably under the spillway bridge, in such a way that a void was formed in the embankment when grains of the fill were washed out.

In order to prevent a recurrence of this condition which could result in a breach of the dam and loss of the pond with resulting damage downstream, the stoplogs in the masonry spillway slot should be removed, one by one, so as to release the pond slowly. After the pond has been drawn down, you should excavate into the embankment, particularly in the vicinity of the spillway bridge abutment wall and determine if the voids in the masonry extend thru the wall so as to allow the flow of water. If this condition does exist, then the voids should be plugged completely from the embankment side with cement masonry or other suitable material. After the entire wall has been so treated, the void should be plugged with an impervious material such as hardpan or clay and then the surface at the top of the embankment and on the upstream face finished off with a sand or gravel coating about 2 ft. in depth. It is possible that a cutoff wall may be needed in connection with the repair work to act as a further preventative measure to flow thru the embankment adjacent to the masonry wall.

An investigation of the embankment may indicate that the only corrective work needed may be the installation of an impervious type core in the upstream section of the embankment along the back face of the wall. This core might even be in the form of a blanket extending to the edge of the water.

I note a heavy timber across the top of the spillway with tines extending therefrom that apparently was installed to act as a fish screen. I do not recall that such a unit has been authorized on the dam nor has an application been made to the County for the installation of a fish screen. This installation should be removed until such time as you have applied for a permit to install a fish screen device and plans as well as a descriptive specification for the installation filed with the County and approved. The heavy timber as now existing could possibly catch large debris in time of flood flow and hold it in such a way as to reduce spillway capacity.

I also call your attention to the fact that the large stones on the upper edge of the emergency swale spillway are still in place though their removal has been recommended in previous letter reports.

Please have the water level in the pond lowered and keep the pond empty until such time as proper repairs can be made to the dam embankment.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson

Nov. 28, 1960


The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

In reference to the request of Mr. Jean Shepard for a meeting with him at some time in Monson at the site of his dam, my office received a call on last Saturday morning requesting that I contact Mr. Shepard at a Wilbraham phone number. Since I was out of Town on that Saturday and did not know in advance of his being in the area, it was impossible for me to meet with him prior to his leaving for a Florida trip.

I wrote to Mr. Shepard and enclose herewith a copy of my communication in connection therewith. The contents of this letter are self-explanatory.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

Enc.

CD Monson
April 4, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

I was informed by Highway Department personnel of the Town of Monson that a settlement had taken place in the embankment of the dam owned by J. E. Shepard on Reimer Road in Monson. Upon notification of this condition, we immediately made an inspection of the dam. The following day a re-inspection was made. As a result, I have sent a letter directly to Mr. Shepard on the matter recommending that the pond be emptied and repairs made to the dam after an investigation is conducted, to determine the cause of the settlement. This investigation will necessitate the excavation of a portion of the embankment adjacent to the spillway and bridge abutment wall, to see if voids exist in the wall that pass directly thru from the embankment to the flow channel of the spillway.

I called Mr. Shepard to discuss the matter with him but found that he is quite sick and should not be contacted at this time. I advised Mrs. Shepard that I would remove one or two of the stoplogs in the spillway myself and begin the draining of the body of water. As now existing, the structure is apparently safe as long as water level in the pond remains at about spillway level. Since the snow has melted from the drainage area and flow of the stream will be diminishing unless heavy Spring rains occur, there should be no further danger at the dam provided the pond is lowered and kept drained until repairs are made.

A copy of my letter to Mr. Shepard is enclosed herewith for your files.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/rmb

CD Monson
April 17, 1963

J. Shepard Company
South Windsor, Conn.

Att: Mr. Jean E. Shepard

Gentlemen:

From time to time during the past two weeks I have made inspections at your dam on Reimers Road in Monson, Mass., and on each inspection have removed one stoplog from the concrete masonry spillway. The body of water has been lowered considerably and the dam is in a safe condition as of the present time. Stoplogs should be kept out of the spillway until such time as the embankment has been repaired.

The upstream face of the embankment adjacent to the spillway abutment wall, where the failure took place, has been exposed as the result of lowering the water level in the pond and it would now appear as if the most practical and economical solution to the problem of making this part of the embankment water-tight would be to excavate the embankment, after lowering the pond another foot or two, for the length of the wingwall back as far as the edge of the road. The material removed would be wasted and the void created by excavation would be backfilled with a mixture of clay and sand or an impervious earth, such as glacial till or soft hardpan. This material should be placed in layers about 6" thick and tamped with hand tampers.

The width of the excavation should be at least equal to the width of the failure and probably 3 or 4 feet further into the embankment. After packing the void to within about one foot of finished grade with the impervious material, the entire excavated area could then be dressed off with gravel or loam, if you desire, above normal water elevation.

If at time of high water in the future it is found that there is still a flow of water thru the embankment and out thru the voids of the stone wall at the

bridge abutment, it will then be necessary to dig down in the road and seal these voids.

Further protection to the dam could be provided in the future by removing three or four stoplogs from the spillway each Fall, so as to lower the water level of the pond during the Winter and Spring months.

When you make the excavation to repair the embankment, please notify me in advance of when the work will be done, so that I may inspect the work during its progress.

Very truly yours

GHM/cmb

George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

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SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
April 4, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts


Gentlemen:

I was informed by Highway Department personnel of the Town of Monson that a settlement had taken place in the embankment of the dam owned by J. E. Shepard on Reimer Road in Monson. Upon notification of this condition, we immediately made an inspection of the dam. The following day a re-inspection was made. As a result, I have sent a letter directly to Mr. Shepard on the matter recommending that the pond be emptied and repairs made to the dam after an investigation is conducted, to determine the cause of the settlement. This investigation will necessitate the excavation of a portion of the embankment adjacent to the spillway and bridge abutment wall, to see if voids exist in the wall that pass directly thru from the embankment to the flow channel of the spillway.

I called Mr. Shepard to discuss the matter with him but found that he is quite sick and should not be contacted at this time. I advised Mrs. Shepard that I would remove one or two of the stoplogs in the spillway myself and begin the draining of the body of water. As now existing, the structure is apparently safe as long as water level in the pond remains at about spillway level. Since the snow has melted from the drainage area and flow of the stream will be diminishing unless heavy Spring rains occur, there should be no further danger at the dam provided the pond is lowered and kept drained until repairs are made.

A copy of my letter to Mr. Shepard is enclosed herewith for your files.

Very truly yours,



George H. McDonnell
County Hydraulic Engineer

GHM/mb

CD Monson
April 17, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Reference is made to the small dam at Reimers Road in Monson, owned by Jean Shepard of South Windsor, Conn. I have been inspecting this dam since a small failure occurred in the embankment and have been drawing down the pond slowly by removing a stoplog from the spillway at the time of each inspection. The water level in storage is now quite low and the dam is safe.

I have written to Mr. Shepard and recommended a method for correcting the problem at the dam and have instructed that he notify me when the work will be done so that I may be present to inspect the repairs to the embankment. The contents of my letter to Mr. Shepard are self-explanatory.

Very truly yours

GHM/cmb
enc.

George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

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HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
April 17, 1963

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

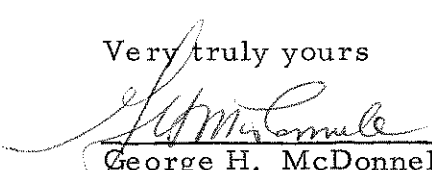
Gentlemen:

Reference is made to the small dam at Reimers Road in Monson, owned by Jean Shepard of South Windsor, Conn. I have been inspecting this dam since a small failure occurred in the embankment and have been drawing down the pond slowly by removing a stoplog from the spillway at the time of each inspection. The water level in storage is now quite low and the dam is safe.

I have written to Mr. Shepard and recommended a method for correcting the problem at the dam and have instructed that he notify me when the work will be done so that I may be present to inspect the repairs to the embankment. The contents of my letter to Mr. Shepard are self-explanatory.

GHM/cmb
enc.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
December 1, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

While making routine inspections of dams in Monson on Friday, November 27, the undersigned noted a serious leak in the dam of J. E. Shepard located on Reimer Road in Monson. The leak has caused the formation of a cavity in the embankment and soil is slowly being washed away. A continuation of this condition over a period of a few weeks could result in the loss of the dam and the breaching of Reimer Road.

While present at the dam, a neighbor of Mr. Shepard's who is caretaker of his property came to the dam and observed my inspection. I pointed out the leak and in the presence of the neighbor, removed one stoplog to begin the lowering of the pond. I instructed the neighbor to remove one additional stoplog each day or at least every second day in order to lower the pond and prevent flow thru the leak in the embankment.

The undersigned shoveled soil into the leak and by packing it tightly, was able to nearly seal the leak in a temporary manner. On leaving the dam, I was of the opinion it would be safe provided stoplogs are removed in accordance with the directed schedule.

I have called Mr. Shepard and have advised him of the condition at the dam. He will immediately hire a Contractor to excavate the embankment, after the pond has been dropped, and to do the necessary repair work under the supervision of the undersigned.

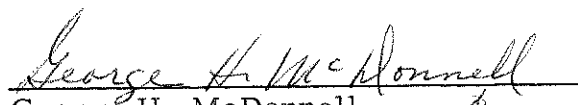
In order that there will be a written record regarding this potential dam failure and regarding notification of the Owner, it is recommended that the enclosed communication be forwarded to Mr. Shepard as soon as possible.

**TIGHE
& BOND CONSULTING ENGINEERS**

-2-

In regard to inspections of dams in the County, this is another case wherein a dam was inspected within the past year, found to be satisfactory and, within a year, a serious leak has developed. If this dam was inspected only once every two years, the next inspection would not have been made until 1965. By that time, the dam would have long since have washed out and a public street breached. In my opinion, as pointed out at various times in the past, the schedule for inspection of dams should continue on an annual basis in order that problems can be recognized early in their development and corrected before failures occur.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

December 2, 1964

J. E. Shepard Company
37 Main Street
So. Windsor, Connecticut

Att: Mr. J. E. Shepard

Dear Mr. Shepard:

The County Hydraulic Engineer of Hampden County made an inspection of your dam located on Reimer Road in Monson, Mass. adjacent to your cottage and reported to this Board that the embankment of the dam is leaking and leakage is such that unless immediate steps are taken to correct the condition, the embankment may be lost and Reimer Road washed out.

Adjacent to the left spillway and bridge abutment wall, water is leaking thru the embankment and is emerging from the stone masonry work that supports the roadway bridge.

While making his inspection, the neighbor living near the dam came to the site and the condition was pointed out to him by the County Hydraulic Engineer. Your neighbor apparently looks after your property in your absence and Mr. McDonnell advised him that the stoplogs should be removed from the spillway and the pond lowered. Water in storage should be lowered to a point whereby the level of the pond will be lower than the elevation at which stored water is entering the embankment.

While at the site, the County Hydraulic Engineer temporarily plugged the leak by shoveling embankment soil into the underwater opening. He also removed one stoplog and left instructions that four to five additional stoplogs should be removed, one every day or two, so that water will be released slowly.

A large void was found in the embankment adjacent to the left spillway abutment wall. In order to protect Reimer Road and to prevent sudden loss of the pond, you are directed that the pond be drawn down as outlined hereinbefore, that the

embankment be excavated and the leakage plugged.

Work in this same general area was done slightly more than a year ago and apparently the soil placed in the embankment was not of a sufficiently impervious nature or was not packed tight enough to prevent movement of water.

When repairs to your dam are done, please contact the County Hydraulic Engineer at his office at area code 413-533-3991 so that he may be present during the repair work and advise your personnel on the proper plugging of the leak in the embankment.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

M. J. E. Shepard

December 16, 1964

J. E. Shepard Company
37 Main Street
South Windsor, Connecticut

Att: Mr. J. E. Shepard

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your lower dam, located at Baldwin Pond off of Reimer Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam was noted to be leaking again at the same location where a leak previously occurred just against the back side of the left abutment wall. Water discharges thru the stone work of the bridge abutment in a fairly sizeable stream. Water flowing thru the embankment to the point of discharge is carrying soil particles and a void was found in the embankment fill. Water also bubbled up thru the floor of the spillway downstream of the crest wall. All flashboards were in place at the time of the initial inspection. One flashboard was removed and a neighbor present at the time of inspection was instructed to remove additional flashboards, one every day or two. On inspecting the dam three days later it was found that no additional flashboards had been removed and the undersigned removed two more flashboards. The removal of these flashboards will result in the water level in storage being lowered to a point where the flow of water into the embankment will stop.

While at the dam on the first of the two most recent inspections, the undersigned plugged the void being formed in the embankment by

shoveling and compacting earth into the opening on the side of the embankment adjacent to and below the surface of the pond.

A special letter-report was written in connection with this structure immediately following the initial inspection when the leak in the embankment was detected.

The Owner should keep the pond drawn down and remove more flashboards if necessary, to be certain that water does not continue to leak into the embankment. The embankment section where the leak has occurred should be dug out completely and the volume or voids so created should be filled with either concrete or clay compacted in layers.

The spillway structure itself was satisfactory. The emergency swale spillway was in good condition. The stones along the crest of this emergency spillway on the upstream edge of the roadway known as Reimer Road should be removed as mentioned in previous reports and replaced with a guard rail similar to that used on the opposite side of the roadway. "

A special letter-report was sent to you in connection with the leak in the embankment at this dam. Also, you have been advised by telephone communication from the County Hydraulic Engineer regarding the conditions at the dam and the need for repairs to the embankment.

Please be certain that a sufficient number of flashboards are removed from the spillway to draw down the pond to a point wherein water cannot enter the void in the embankment. Before the flashboards are replaced, the embankment should be properly repaired by excavating embankment material along the wall of the spillway and bridge abutment and then replacing this material with a densely packed clay fill or mass concrete. When this material is being placed, the County Hydraulic Engineer should be advised so that he can be present to inspect the work.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

CD Monson
March 22, 1965

The Hon. The Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Thursday, March 18, 1965, I made a special inspection of the Shepard Dam on Reimers Road in Monson. This is the dam that developed a leak late in 1964 and on which special inspection reports were submitted. I also have talked with the owner of the dam and outlined to him, at the time the leak was detected, the manner in which the repair work should be accomplished.

Stoplogs were taken out of the spillway by the undersigned last year in order to lower the level of the stored water below the point at which ponded water was entering the embankment. The undersigned placed a temporary plug of compacted earth in the cavity thru which the water was running. I was concerned over the possibility that with the coming Spring rainy season, water in storage might rise to an elevation where flow would again take place thru the void in the embankment. To help prevent this condition from occurring, I have taken another stoplog out of the spillway to lower the level of the pond another 6".

Conditions at the dam are the same as previously reported and no repair work has as yet been started. Provided the Owner does not replace the stoplogs without first repairing the embankment, the dam should be safe in its present condition.

This report is sent to you for your files so that there will be a complete record of conditions at the dam.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mg

CD Monson
March 22, 1965

The Hon. The Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Thursday, March 18, 1965, I made a special inspection of the Shepard Dam on Reimers Road in Monson. This is the dam that developed a leak late in 1964 and on which special inspection reports were submitted. I also have talked with the owner of the dam and outlined to him, at the time the leak was detected, the manner in which the repair work should be accomplished.

Stoplogs were taken out of the spillway by the undersigned last year in order to lower the level of the stored water below the point at which ponded water was entering the embankment. The undersigned placed a temporary plug of compacted earth in the cavity thru which the water was running. I was concerned over the possibility that with the coming Spring rainy season, water in storage might rise to an elevation where flow would again take place thru the void in the embankment. To help prevent this condition from occurring, I have taken another stoplog out of the spillway to lower the level of the pond another 6".

Conditions at the dam are the same as previously reported and no repair work has as yet been started. Provided the Owner does not replace the stoplogs without first repairing the embankment, the dam should be safe in its present condition.

This report is sent to you for your files so that there will be a complete record of conditions at the dam.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mg

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON.

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
March 22, 1965

The Hon. The Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Thursday, March 18, 1965, I made a special inspection of the Shepard Dam on Reimers Road in Monson. This is the dam that developed a leak late in 1964 and on which special inspection reports were submitted. I also have talked with the owner of the dam and outlined to him, at the time the leak was detected, the manner in which the repair work should be accomplished.

Stoplogs were taken out of the spillway by the undersigned last year in order to lower the level of the stored water below the point at which ponded water was entering the embankment. The undersigned placed a temporary plug of compacted earth in the cavity thru which the water was running. I was concerned over the possibility that with the coming Spring rainy season, water in storage might rise to an elevation where flow would again take place thru the void in the embankment. To help prevent this condition from occurring, I have taken another stoplog out of the spillway to lower the level of the pond another 6".

Conditions at the dam are the same as previously reported and no repair work has as yet been started. Provided the Owner does not replace the stoplogs without first repairing the embankment, the dam should be safe in its present condition.

This report is sent to you for your files so that there will be a complete record of conditions at the dam.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mg

April 10, 1968

J. E. Shepard Company
37 Main Street
South Windsor, Connecticut

Attn: J. E. Shepard

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your lower dam, located at Baldwin Pond off of Reimer Road in Monson has recently been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"When inspected on Tuesday, April 2, 1968, it was noted that water apparently has again been seeping behind the left abutment wall of the spillway and emerging into the spillway channel thru the stone masonry wall of the roadway bridge left abutment. It is apparent that when the water level in the pond was at maximum springtime elevation, seepage occurred along the back of the left spillway wall. This condition has occurred during previous springtime high water conditions and the owner, at least twice in the past, has been directed, and he did, fill the void behind the wall with a clay-like impervious material. It is apparent that the manner in which the material is being placed is not successful, since leakage has re-occurred.

It would seem advisable that the pond be drawn down, that all fill located at the rear of this left spillway wall be dug out and new fill be put in under supervision, with each layer of fill being placed individually and thoroughly rammed and compacted into place.

At the time of the recent inspection, one stoplog was off the crest of the spillway and water was passing over the top of the uppermost stoplog. It was impossible to make an examination of the spillway masonry and stoplogs because of the quantity of water passing the spillway. A re-inspection of this dam will be made later this summer when the flow of water has decreased and a more thorough examination can be made of the stoplog slots and the masonry of the spillway floor.

The large boulders located along the crest of the emergency overflow spillway are still in place and these should be removed. Their presence will reduce the ability of the emergency spillway to pass water should flood flow conditions be experienced again. "

The recommendations of the County Hydraulic Engineer as contained hereinbefore should be followed by you during the present year. The fact that water continues to seep through the embankment behind the wing wall indicates that repairs as carried on previously have not been in a thorough manner as required on dam construction work. The seepage tunnel or hole must be followed back along the wall by careful and exploratory excavation methods. When the entire route of the seepage has been located, the hole must then be backfilled with proper soil of an impervious nature packed by hand in thin layers. Once the cavity is properly refilled, there should be no further problem with seepage behind the wall.

The large boulders used as highway sideline markers along the crest of the emergency spillway will act to decrease the capacity of the spillway in time of flood flow and should be removed as previously recommended.

Any further information concerning your dam which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
ROBERT W. GHERIDAN
LEONARD J. DAYON

**TIGHE
& BOND**

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3221

CD Monson
March 17, 1969

J. E. Shepard Company
37 Main Street
South Windsor, Connecticut

Attn: Mr. J. E. Shepard

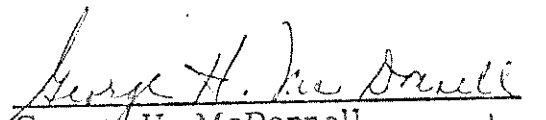
Gentlemen:

Reference is made to your dams in the Town of Monson, and the fact that there now exists a heavy snow cover throughout Western Massachusetts. The water content of this snow cover, coupled with a warm spring rain could result in extremely heavy runoff conditions. Consequently, the Commissioners of Hampden County have directed that I advise you to be sure that the spillway facilities at your dams are clear of any obstruction and that you take all precautions necessary to protect your dams as well as persons and property downstream.

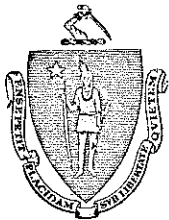
Flashboards and stoplogs should be removed from the spillway, particularly at the lower dam, to provide maximum spillway capacity for anticipated flood flows. In removing flashboards and stoplogs, care should be exercised not to release too much water at one time. The discharge should be controlled to prevent temporary flooding downstream.

If you have any question in connection with this matter, the undersigned can be reached at the above address and telephone number.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXX~~

Floyd W. Pradet

Stephen A. Moynahan

October 22, 1969

J. E. Shepard Company
37 Main Street
South Windsor, Connecticut

Attention: J. D. Shepard

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your two dams rotated off of Reimer Road in Monson, Massachusetts, have been inspected by our County Hydraulic Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Upper Dam

This dam is in the same general condition as reported at the time of the last inspection except for the fact that the asbestos-cement spillway pipe is partly blocked with twigs and debris. The undersigned attempted to clean out the pipeline but it was not possible. Proper tools will be needed to do the work.

The earth embankment is in fair condition. There are trees growing from the embankment and adjacent to it. However, this tree growth does not endanger the dam. Some toe leakage was observed, particularly at the left end of the dam. No soil was being washed with the toe leakage.

The old stone spillway now improved with a new concrete cap was operating satisfactorily. It was clear of any debris, water in the pond was at the crest of the spillway, and there were no flashboards on the crest.

The old canal located to the right of the spillway is operating and passing water along the right side of the spillway.

This pond, though quite large in area, holds very little water and is overgrown with brush and trees. Much of the pond volume has been filled in with sand, gravel, soil and debris washed in from upstream by previous flood flows. It is doubtful if the average depth of water over the entire pond exceeds two feet.

Lower Dam

The road across the embankment is o.k. Large stones still exist as a highway guard fence at the emergency flood swale spillway. The swale spillway was satisfactory. Some brush growth is occurring from the grouted stone sloping portion of the spillway and this brush growth should be cut down and the root structure killed. If the brush is allowed to continue to grow, root structure will damage the grouted stone paving by cracking the concrete and lifting the stones.

At the concrete spillway adjacent to the roadway bridge, stoplogs were in the slots to the full normal height. Water level in storage was at the top of the upper stoplog.

Seepage is again taking place behind the left spillway wall. The seepage water can be observed emerging from the roadway bridge abutment and discharging into the stream. The point of discharge is near the base of the abutment near the upstream corner.

An examination of the embankment material in the area just behind the abutment wall shows that a cavity is being formed and, in the very near future, the surface of the ground will settle. In fact, the undersigned was able to find a sizeable cavity in one location by simply stomping the surface of the ground behind the abutment wall.

Leakage at this location has occurred in the past. Proper repairs have never been made. As long as conditions within the embankment provide for a path for water from the pond to the open stone masonry of the bridge abutment, soil will be washed out and settlement of the embankment will occur.

The area should be excavated again and the path of water plugged tightly with impervious material properly compacted. Once the

underground waterway is cut off there should be no further problem with seepage and settlement with the embankment.

It is recommended that the owner be advised to make repairs behind the left abutment wall again and to be sure that the persons making the repairs are fully aware of the type of soil needed and the manner in which the repairs are to be made."

The maintenance and report work as needed in accordance with the report of the County Hydraulic Engineer, should be accomplished as soon as possible. The spillway pipe at the Upper Dam should be cleaned out and maintained.

At the Lower Dam, the earth embankment is again failing as a result of water from the pond flowing through the embankment material, and emerging from the open joints of the stone wall supporting the roadway bridge. Movement of water through this portion of the embankment must be controlled if the embankment is to remain safe. The pond should be drawn down and the entire area of the embankment excavated wherever there is evidence of poor material and water movement. The entire area should then be plugged tightly with proper impervious material compacted in a workmanlike manner, layer upon layer. The layers should be laid down 6 inches to 8 inches in thickness at most and each layer rammed in place. If you find that it is difficult to obtain good material and quality workmanship in packing the material in place, consideration could be given to the use of mass concrete in this area.

The work should be completed before winter if at all possible. If this is not possible, then the pond should be drawn down and kept drawn down throughout the winter until the repair work can be accomplished next spring.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Greany Dam



1950 Monson

Small dam located on property on Silver Street.

| | |
|-----------|----------------|
| City/Town | Monson |
| Dam | Greany Dam |
| Name | Greany, John V |
| Name | Greany, John D |
| Streets | Silver Street |

JOHN V. GREANY, M. D.
565 CAREW STREET
SPRINGFIELD, MASS.

August 24, 1950.

Charles D. Bray, Chairman Hampden County Com.
71 Main Street
Chicopee Falls, Mass.

Dear Sir:

I would like permission to repair a
dam on my property at Silver Street, Monson
Mass.

Very truly yours,

A handwritten signature in cursive script, appearing to read "John V. Greany".

M.D.

JVG:H

Oct. 5, 1960

Dr. John V. Greany
565 Carew Street
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the small dam, located on your property on Silver Street, in Monson, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This is a very small structure that does not come under County jurisdiction. However, the Owner has requested that it be inspected from time to time and any advice as to maintenance be passed on. When checked on Sept. 15, 1960, there was little evidence of damage resulting from the heavy runoff of the hurricane rains that occurred Sept. 12th. Only one small hole was noted washed in the top of the embankment, near the right of the dam. This was apparently the result of water flowing over the embankment. The spillway channel was found to be clear and operating satisfactorily. Apparently, the heavy runoff during the hurricane caused water in the small pond to raise high enough to overflow the embankment. The small washed area should be filled with packed earth. If the Owner desires, the embankment raised previously, could be raised about another 6-inches to prevent overtopping except in very extreme storms. However, overtopping that will occur based on the existing spillway capacity, will be quite infrequent and little damage will ever be done, unless the severity of the storm is exceedingly great."

As existing your dam does not come under County jurisdiction and consequently any comment in relation thereto is simply submitted to you for whatever action you wish to take. It is our understanding that you wish to have the dam inspected periodically and the findings of the Engineer submitted to you.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
March 22, 1965

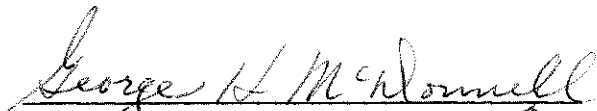
The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Wednesday, March 17, 1965, at 3:55 P.M., I received a telephone call from Dr. Greany, that two leaks had developed in his dam in Monson. This dam is a very small dam, it impounds an insignificant quantity of water and does not come under County jurisdiction. However, at the request of Dr. Greany some years ago, I have always provided him with any advice and guidance when he has asked for it and I have annually checked the dam and kept a record of its condition. On Thursday, March 18, I went to Monson and checked the two small leaks that he noted. The leaks are large enough whereby the pond is below spillway elevation and, if allowed to continue for any length of time, this small dam might eventually be breached. However, as mentioned hereinbefore, breaching of the dam would release such an insignificant quantity of water that no damage would be done downstream.

I am enclosing a copy of my communication to Dr. Greany for your files. The contents are self-explanatory.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

CD Monson
March 22, 1965

Dr. John D. Greany
565 Carew Street
Springfield, Massachusetts

Dear Dr. Greany:

In accordance with your request of March 17, 1965, pertaining to the existence of two leaks in your small dam on your property at Monson, I inspected the dam on Thursday, March 18, and noted the leaks mentioned in your telephone message. Leakage emerges from the downstream face of the dam at the toe of the rock fill but by examining the downstream face of the embankment carefully, it was readily determined that the leakage in the embankment is near the top and water passing thru the embankment cascades downward thru the rock fill near the downstream face.

An examination of the shoreline of the pond indicated two locations where water from the pond is flowing into the dam embankment.

The smaller of the two leaks is to the left of the gate valve box on the draw-down pipe at a point about 7 ft. away. The larger of the two leaks is to the right of the gate valve box at a distance of about 11 ft. away. These distances were measured from the gate key valve box as I stood on the dam and faced the pond. I drove a stake into the embankment at the location where leakage is entering the dam.

From my observation in the field, it would appear as if water has found its way thru the embankment fill and a passageway has been formed in the voids of the stone and thru the gravel that forms the small embankment.

If you will observe the surface of the water at the location of each of the two stakes driven into the upstream face of the embankment, you can see water flowing into the dam.

The first step in repairing the dam would be to open the drawdown gate and lower the water level about 3 ft. It would probably be advisable to drain the water out completely, leaving the drawdown gate open while the leaks are being repaired.

After the water has been emptied and the material of the embankment dried out, you should excavate at the location of each stake a cavity about 2-1/2 ft. below the elevation of where the stake is driven into the dam and about 3 ft. each side of the stake along the shoreline. Thus, each excavation will be about 6 ft. wide in the direction of the length of the dam.

The width of the excavation should be about 4 ft. back into the embankment from where the stakes are located. In digging each excavation, dig to a flat bottom to the depth hereinbefore recommended. The side slopes of the excavation need not be vertical. The material will slope back to its natural position when in a dry state.

After the excavations have been completed, you should then obtain some clay or similar very dense impervious soil. The impervious soil should be laid on the flat bottom of each excavation to a depth of 6" and packed tightly with a hand tamper. When this work has been completed, another 6" layer of loose impervious material should be laid down and packed with a tamper. You should then line the two sloping sides of each excavation and the end of the excavation away from the pond with two 6" layers of hand tamped or rammed clay, till, or hardpan. This material should be free of any stone more than 2" in diameter.

When the work has been completed, you will have lined the bottom and the sloping sides of each excavation with approximately 9" to 10" of compacted impervious material. Each 6" layer that is placed and then compacted will end up probably in the range of 4-1/2" to 5" in thickness. Each hole will then have a water tight lining thru which ponded water will not be able to pass. You should then take the finer grained material that has been dug to form the two excavations and backfill these excavations, tamping the material in 8" layers. If the material is quite coarse, you could mix one shovel full of clay or other impervious soil with a shovel full of the excavated material. The stones and boulders removed in this process could then be put back last as a surface lining on the upstream face of the repaired section.

Since these two leaks have apparently developed thru natural causes and long time exposure of the embankment to the ponded water, it is possible that the water may break thru in other areas in the future. If this does happen, I would then recommend that the entire upstream face of the embankment be dug out to a depth of about 3 ft. and a blanket of clay laid across the upstream face of the excavated embankment. This blanket of clay would be laid in the

same manner as described hereinbefore for the excavated cavities. The material dug out of the face of the embankment would then be replaced, the finer material against the clay and the coarser material at the surface for water erosion protection. However, I do not think this entire face work is needed at this time and suggest that the two leak areas be repaired as outlined herein.

If I can be of any further help to you, please do not hesitate to call upon me. If you do repair the two leaking areas as suggested, and if you wish to have me check the work as it progresses, I would be pleased to go down again whenever you call. If you do this, I suggest that you call after the pond has been drained and the two excavations made. Also, it would be well if you had a sample of the clay-like material that you would be using for a liner so that I could observe its characteristics.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

CD Monson
March 22, 1965

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Wednesday, March 17, 1965, at 3:55 P.M., I received a telephone call from Dr. Greany, that two leaks had developed in his dam in Monson. This dam is a very small dam, it impounds an insignificant quantity of water and does not come under County jurisdiction. However, at the request of Dr. Greany some years ago, I have always provided him with any advice and guidance when he has asked for it and I have annually checked the dam and kept a record of its condition. On Thursday, March 18, I went to Monson and checked the two small leaks that he noted. The leaks are large enough whereby the pond is below spillway elevation and, if allowed to continue for any length of time, this small dam might eventually be breached. However, as mentioned hereinbefore, breaching of the dam would release such an insignificant quantity of water that no damage would be done downstream.

I am enclosing a copy of my communication to Dr. Greany for your files. The contents are self-explanatory.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

CD Monson
March 22, 1965

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

On Wednesday, March 17, 1965, at 3:55 P.M., I received a telephone call from Dr. Greany, that two leaks had developed in his dam in Monson. This dam is a very small dam, it impounds an insignificant quantity of water and does not come under County jurisdiction. However, at the request of Dr. Greany some years ago, I have always provided him with any advice and guidance when he has asked for it and I have annually checked the dam and kept a record of its condition. On Thursday, March 18, I went to Monson and checked the two small leaks that he noted. The leaks are large enough whereby the pond is below spillway elevation and, if allowed to continue for any length of time, this small dam might eventually be breached. However, as mentioned hereinbefore, breaching of the dam would release such an insignificant quantity of water that no damage would be done downstream.

I am enclosing a copy of my communication to Dr. Greany for your files. The contents are self-explanatory.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXXXXXX~~

Floyd M. Fradet

Stephen A. Moynahan

October 22, 1969

Monson Dam

Dr. John V. Greany
565 Carew Street
Springfield, Massachusetts

Dear Dr. Greany:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your small dam and pond located in Monson has been recently inspected by our County Hydraulic Engineer and your attention is called to the following conditions noted and recommendations made by him.

"There was some seepage at the toe of the dam near the left end of the embankment. This is the area where the embankment has been repaired. Apparently, the embankment was dug out and then replaced to reduce seepage in this section of the dam. It appears as if the newly placed material is of a poor grade and has not been properly compacted. The undersigned observed large boulders, sticks and roots in the new embankment fill.

If seepage continues and as a result the pond is lowered during dry summer weather, the owner should dig out the area again, clean the soil down to the foundation of the dam, and then replace the soil in 6" horizontal layers, each layer thoroughly and properly compacted. No stones over 4 inches in size should be used in the backfill nor should there be any roots, logs or vegetation of any type whatsoever. The soil used should be an impervious material of either a clay or a hardpan nature. The most impervious of the soil should be in the middle third of the compacted repaired area while more pervious material could be used on the two outside slopes.

The spillway channel around the left end of the dam was operating satisfactorily. It was free of any debris.

In the opinion of the undersigned, the dam is safe. Though it does leak, the leakage is more of a nuisance nature in that the pond can be drained away during dry summer weather."

If you find that seepage continues and increases to a point where the repair work must be done again to maintain a safe dam and to have a full pond during dry summer weather, the recommendations contained in the report of the County Hydraulic Engineer should be followed. When and if the small embankment is dug out again and material brought to the site for repairing the embankment, the County Hydraulic Engineer would be pleased to advise you and your contractor, at the site, as the work is being done, relative to the quality of material and the manner in which it should be placed. Proper material while compacted and placed in workmanlike manner on a good foundation should eliminate any seepage problem.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Page 40 of report

Ralph Van Wagner,
Palmer, Mass.

you are notified that your
dam, located on a small tributary to the Quabog
River so called in the town of Monson, etc.

"The dam is in poor condition, and
it is recommended that it be repaired and
the spillways enlarged and permanently
constructed if the ice pond is to be maintained;
otherwise the pond should be drawn down. The
trees growing on the downstream face of the
embankment should be cut down."

Now, therefore, etc.

March 10, 1926

Ralph Van Wagner,
Palmer, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on a small tributary to the Quaboag River so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in poor condition, and it is recommended that it be repaired and the spillways enlarged and permanently constructed if the ice pond is to be maintained; otherwise the pond should be drawn down. The trees growing on the downstream face of the embankment should be cut down."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Trombly Dam fka Van Wagner Dam



1926 Monson

Located on small tributary of the Quaboag River.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Van Wagner Dam |
| Dam | Trombly Dam |
| Name | Van Wagner, Ralph |
| Name | Trombly, J S |
| Water | Quaboag River |

*Received by
J. S. Trombly*

J. S. Trombly,
Palmer, Mass. (R.F.D. #1)

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on a small tributary to the Quaboag River so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in poor condition, and it is recommended that it be repaired and the spillways enlarged and permanently constructed if the ice pond is to be maintained; otherwise the pond should be drawn down. The trees growing on the downstream face of the embankment should be cut down."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

*Signed by
Comm. Book, Perry F. Hall*

November 17, 1926

J. S. Trombly,
Palmer, Mass. (R.F.D.#1)

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on a small tributary to the Quaboag River so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in poor condition, and it is recommended that it be repaired and the spillways enlarged and permanently constructed if the ice pond is to be maintained; otherwise the pond should be drawn down. The trees growing on the downstream face of the embankment should be cut down."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

C/N

Jurczyk Dams (Upper & Lower)



o Monson

Upper & Lower Dams located on Stage Coach Lake. See also: County Roads Plan #22 (1959) "Dam & Spillway Bumstead Road - Wm W Jurczyk Inc", and Plan #23 (1961) "Earth Dam & Overflow - Wm W Jurczyk Inc".

City/Town Monson

| | |
|-----|------------------------------|
| Dam | Jurczyk Dams (Upper & Lower) |
|-----|------------------------------|

Name Jurczyk, William

| | |
|------|---------------------|
| Name | William Jurczyk Inc |
|------|---------------------|

Water Stage Coach Lake

April 10, 1968

William W. Jurczyk, Inc.
16 Oak Street
Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that both your Lower and your Upper Dams located at Stagecoach Lake have been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

Ever since the construction of your Lower Dam you have been advised that the flashboard on this dam is not in keeping with the approved plans on file in this office. You have been directed to take action in connection with this flashboard problem by either reducing the flashboard to a height of 10" above the crest of the spillway or raising the side walls of the spillway abutments and the top of the earth embankment to provide the required freeboard as shown on the filed drawings.

In accordance with the provisions of Chapter 253 of the General Laws of the Commonwealth of Massachusetts and the applicable sections regarding safety of reservoirs and dams, you are hereby notified that unless you comply with the directive to correct the flashboard and related freeboard at your Lower Dam by June 30, 1968, the water in your pond will be drawn down and the present flashboard removed.

All costs to the County for accomplishing this will be charged to you in accordance with the provisions of the law.

In regard to your Upper Dam, conditions as noted at the recent inspection are in general, the same as reported previously. No action has been taken in connection with developing a turf cover on the downstream surface of the dam embankment. This must be done during 1968.

The joint at the end of the third pipe from the spillway shaft should be caulked in such a manner as to prevent the movement of fine soil through this joint. Caulking of this and any other joint showing signs of earth movement should be accomplished by June 30, 1968. Failure to accomplish the repair of this and any other leaking joint will necessitate action under the General Law and the cost of repairs as would be done by others will be assessed to you.

A number of small trees have been planted on the downstream slope of the embankment. These trees will grow fairly rapidly and will become sizeable within the next 4 or 5 years. At that time, the trees will be ordered cut down.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Liscek Dam - Lower



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Liscek Dam - Lower |
| Name | Liscek |

MONSON
D13028

LISCEK DAM - LOWER

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Liscek Dam - Upper



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Liscek Dam - Upper |
| Name | Liscek |

MONSON
D13028

LISCEK DAM - UPPER

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Lunden Dam - Upper



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Lunden Dam - Upper |
| Name | Lunden |

MONSON
D13030

LUNDEN DAM - UPPER

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Flynt Dam



1926 Monson

Located on Sullivan Brook at the outlet of Smith Pond. Also see: Remington Dam Dam fka Flynt Dam.

| | |
|-----------|----------------|
| City/Town | Monson |
| Dam | Flynt Dam |
| Name | Flynt, Lyman C |
| Water | Sullivan Brook |
| Water | Smith Pond |

January 24, 1929

Mr. James L. Tighe,
189 High Street,
Holyoke, Mass.

Dear Mr. Tighe:

I am enclosing herewith copy of a
letter we received from Mr. Lyman C. Flynt in reply
to our letter of December 31, 1928, for your files.

Yours very truly,

COUNTY COMMISSIONERS

By _____

N.
Enc.

LYMAN C. FLYNT
8 HIGH STREET
MONSON, MASSACHUSETTS

March 4th 76

County Commissioner
Springfield
Mass
Dear Sir

In reply to your
of March 3rd. The dam has leaked
for a long time I don't think the
leak is any greater than five
years ago. I think the dam is
good for many years. Nevertheless
I will see that the water is drawn
off -- If agreeable to you I should like
to wait till the ice goes off. For drawing
now the ice would fall and kill all
the fish. If I thought there was any
immediate danger I would not mind
the fish. It is a small pond the average
depth I think is not over three feet.
Awaiting your reply I am
Yours very truly L. C. Flynt,

Page 48 of report

Lyman C. Flint,
Monson, Mass.

you are notified that your
dam, located on Twelve Mile Brook so called in the
Town of Monson, etc.

"The dam is in poor condition
and leaks considerably. It is recommended,
therefore, that if the dam is to be maintained,
the leakage be repaired and that meanwhile
the pond be drawn down which the owner
proposed doing on being told of the condition
of the structure."

Now, therefore, etc.

March 10, 1926

Mr. Lyman C. Flynt,
8 High Street,
Monson, Mass.

Dear Sir:

This will acknowledge receipt of your
letter of March 4, 1926.

If the dam is repaired in the early part
of the Spring after the ice goes off and the frost
is away so that it is practical to work, it will be
satisfactory to the County Commissioners.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

GSC/N

March 3, 1926

Mr. Lyman C. Flint,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Twelve Mile Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in poor condition and leaks considerably. It is recommended, therefore, that if the dam is to be maintained, the leakage be repaired and that meanwhile the pond be drawn down which the owner proposed doing on being told of the condition of the structure."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

April 6, 1926

Mr. George C. Flint,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 354 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Sullivan Brook at the outlet of Smith Pond so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is not in very good condition, although not unsafe. To increase its factor of safety, the top of the structure should be raised at least two feet above the crest of the overflow."

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

November 13, 1926.

Mr Lymon C. Flint,
Monson, Mass.

Dear Sir,

In regard to your dam in Monson, which the commissioners sent you a notice about on March 2, last, also about which there was some correspondence afterwards, we beg to state that our Engineer, who has inspected the dam recently, has reported that repairs have been made thereon but that notwithstanding, there still appears to be leakage through the structure.

He advises, that if it is the intention to maintain the pond, that gravel sufficient in quantity to stop the leakage be deposited the coming summer along the up-stream toe and face of the structure. Otherwise, if the structure is not to be maintained, that a breach be made therein, of sufficient size, to discharge the flow of the stream at all times without backing up water.

Yours very truly,

COUNTY COMMISSIONERS

By _____

Chairman.

November 17, 1926

Mr. Lyman C. Flint,
Monson, Mass.

Dear Sir:

In regard to your dam in Monson, which the Commissioners sent you a notice about on March 2, last, also about which there was some correspondence afterwards, we beg to state that our Engineer, who has inspected the dam recently, has reported that repairs have been made thereon but that notwithstanding, there still appears to be leakage through the structure.

He advises, that if it is the intention to maintain the pond, that gravel sufficient in quantity to stop the leakage be deposited the coming summer along the up-stream toe and face of the structure. Otherwise, if the structure is not to be maintained, that a breach be made therein, of sufficient size, to discharge the flow of the stream at all times without backing up water.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Mr. Lyman C. Flint,
Monson, Mass.

Dear Sir:

Inasmuch as your dam was inspected quite recently by our engineer who found that the repairs made thereon are not sufficient, your attention is called to the notices sent to you on March 3d and November 17th 1926 copies of which are herewith enclosed.

LYMAN C. FLYNT
8 HIGH STREET
MONSON, MASS.

Jan 10th 1919

Geo. D. L. Chairman
Springfield Mass

Dear Sir

Your letter of Dec 31st
at hand and contents noted -
It is a queer leak I don't think it has increased
in the last 12 to 15 years I have ordered gravel
put in right away and when the ice goes off
will try to put enough gravel to stop the leak

Yours very truly
L. C. Flynt.

Schimmel Dam fka Brown Dam



1958 Monson

Located on property near Peck & Cote Roads. Also see: Brown Dam.

| | |
|-----------|------------------|
| City/Town | Monson |
| Dam | Brown Dam |
| Dam | Schimmel Dam |
| Name | Brown, E L |
| Name | Schimmel, Milton |
| Streets | Peck Road |
| Streets | Cote Road |

Oct. 22, 1958

Dr. Milton Schimmel
175 State Street
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson near the intersection of Cote Road with Peck Road has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"E. L. Brown Dam This dam is now owned by Dr. Milton Schimmel of 175 State Street in Springfield. The concrete and stone masonry at the spillway lip and to the right of the spillway on the dam should be repaired. Flashboards now in place should be removed until after the spring runoff. It would be advisable to remove the flashboards each fall and to replace them in the late spring. This dam does not come under County jurisdiction since the drainage area is just a quarter of a square mile, the height of the dam is but 6 ft. and the normal quantity of water in storage is less than 1,000,000 gallons. The dam has been carried on County records for many years. It is recommended that the owner be notified of the condition of the dam so that he may take corrective action, if he so desires, pertaining to the needed maintenance."

The information contained herein is forwarded to you for whatever action you care to take. It was thought advisable to notify you of the needed maintenance. Many times a small amount of maintenance in the early stages of deterioration can save larger costs at a later date.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,
BOARD OF COUNTY COMMISSIONERS

Oct. 25, 1961

Dr. Milton Schimmel
175 State Street
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on property in Monson, near Peck & Cote Roads has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Some patching of the masonry at this dam should be done in the near future, particularly at the upper end of the spillway chute and in the right wall thereof. The masonry at this point has been eroded quite deeply and high rates of overflowing water may eat thru the remaining thin masonry section and thus begin to do damage to the earth embankment itself. The masonry wall along the edge of the water on the pond side of the dam is also in need of repair.

The earth embankment is satisfactory and is well shaped, as well as properly maintained.

It is recommended that the Owner be advised regarding the repairs to the masonry so that the repairs can be done before more expensive repairs might be needed in the future."

The condition as noted by the County Hydraulic Engineer in his report is not serious and at the present time does not endanger the small dam. However, if repairs are made in the near future, they will be minor repairs and may prevent the occurrence of a failure which could require major

repairs at a later date.

According to our County records, you are still listed as the Owner of this dam. If you have transferred ownership of this dam, will you please so notify us.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

Monson Associates Corporation Dam



1926 Monson

Located on Chicopee Brook.

| | |
|-----------|-----------------------------------|
| City/Town | Monson |
| Dam | Monson Associates Corporation Dam |
| Name | Monson Associates Corporation |
| Water | Chicopee Brook |

Page 42 of report

Monson Associates Corporation,
Monson, Mass.

you are notified that your
dam, located on Chequamegon Brook or called in the
Town of Monson, etc.

"The dam is in fair condition,
but there is some brushwood growing in
and around the structure which should
be cut down."

Now, therefore, etc.

March 3, 1926

Monson Associates Corporation,
Monson, Mass.

Gentlemen:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Chicopee Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam is in fair condition, but there is some brushwood growing in and around the structure which should be cut down."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

November 17, 1926

Monson Associates Corporation,
Monson, Mass.

Gentlemen:

Inasmuch as your dam was inspected quite recently by our Engineer who found that no repairs had been made thereon, your attention is called to the notice sent to you on March 3, 1926 of which a copy is herewith enclosed.

In case you would like further information regarding the repairs required than that contained in notice, should you communicate or call upon our Engineer, James L. Tighe of the firm of Tighe & Bond, 189 High St., Holyoke, Mass., he will be glad to advise you.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

C/N
Enc.

Monson State Hospital Dam



1951 Monson

Dam westerly of Granite Street.

| | |
|-----------|---------------------------|
| City/Town | Monson |
| Dam | Monson State Hospital Dam |
| Name | Monson State Hospital |
| Streets | Granite Street |
| Water | Quaboag River |

April 26, 1933

Monson State Hospital,
Monson, Mass.

Gentlemen:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your lower dam, located on a tributary of the Quabog River in the Town of Monson, has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"The top of the embankment is considerably eroded in places, especially around the ice run-way and behind the walls of the overflow. This erosion should be filled in with suitable material and the entire top of the embankment leveled up."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

November 28, 1951

Monson State Hospital
Monson, Massachusetts

Attention: Superintendent of Maintenance

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located westerly of Granite Street directly above the abandoned dam has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Fill behind the northerly abutment wall has been partially washed out. The earthfill should be brought to grade with tamped gravel."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

*Monson State Hospital -
Land between Upper and
West of Granite Street
Monson*

December 17, 1952

Monson State Hospital
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located westerly of Granite Street directly above the abandoned dam has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Fill behind the left abutment wall has been partially washed out and the hole should be packed with hard gravel."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____ Chairman

Monson Water Works Dam



1950 Monson

Dam located on Conant Brook just downstream from the new Army Corp of Engineers Flood Control Dam on Conant Brook.

| | |
|-----------|------------------------|
| City/Town | Monson |
| Dam | Monson Water Works Dam |
| Name | Monson Town Water |
| Water | Conant Brook |

September 20, 1950

Board of Water Commissioners
Town Hall
Town of Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"The drawoff pipe has been sealed on its downstream side by a steel plate fastened to the pipe outlet. Full hydrostatic head is now on the drawoff pipe through the dam. Proper repairs to the drawoff gate and pipeline on the upstream side of the dam should be made immediately, and the steel plate covering the discharge end of the pipe should be removed."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

*Monson Water Works Dam
Monson*

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND *CONSULTING ENGINEERS*

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
May 15, 1969

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Re: Monson Water Dept. Dam
Monson, Mass.

At the request of the Superintendent of the Monson Water Department, the undersigned inspected the Monson Water Department Dam on Wednesday, May 14, 1969 to view apparent leakage occurring at the right abutment area and downstream of the dam itself.

The dam is a stone masonry structure across Conant Brook just downstream from the new Federal Government flood control dam. The Water Department Dam forms a pond which is used for water supply purposes.

The right abutment of the dam consists of two masonry walls, one about in line with the downstream face of the overflow section of the dam and the other wall extends upstream and towards the shore. The space between the two walls is apparently filled with earth and surfaced with loam and a thin, rough turf.

Downstream of the dam and extending parallel to Conant Brook, on each side of the brook, is a concrete retaining wall which terminates at a nearby downstream roadway culvert structure.

The brook downstream of the overflow portion of the dam is contained within the concrete masonry training walls from the toe of the dam to the downstream roadway culvert. The elevation of the top of the downstream walls is roughly 5 feet more or less above the stream bed.


The earth fill behind the right training wall is saturated with water and water flows out of the ground, across the top of the right training wall and into the stream below the dam. The area immediately downstream of the dam and behind the right wall has been very wet this spring. The Superintendent of the Water Department informed me that he has never observed the area as wet as noted recently.

I observed some seepage through an exposed portion of the stone masonry of the dam between the spillway and the area under investigation. This seepage is typical for an old stone masonry dam and does not indicate a serious condition.

An examination of the earth fill between the abutment walls shows no evidence of settlement. Thus, if water is flowing through the right abutment area and emerging just downstream of the dam behind the right training wall, the fact that there is no evidence of settlement in the abutment area indicates that the seepage water is not dangerous as to volume or velocity. I have advised the Superintendent of the Water Department to observe the wet area just to the right of and downstream of the dam frequently during the next few weeks for the purpose of determining whether or not the wet condition subsides. There is a good possibility that normal ground water conditions related to the very wet spring weather has contributed to the saturated condition of the soil downstream of the dam and to the rear of the right training wall. If the saturated condition does subside while water level in storage remains about normal, it can then be concluded that leakage through the dam is not the major cause for the wet condition.

In summary, it is my opinion that conditions are not dangerous at this dam. It is recommended that a notice be sent to the Board of Water Commissioners of Monson advising them of this opinion.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts
County of Hampden
Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXX~~

Floyd M. Fradet

Stephen A. Moynahan

October 22, 1969

Monson Water Department
Town Office Annex
Monson, Massachusetts

Attention: Board of Water Commissioners

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Conant Brook, just downstream from the new Corp. of Engineers Flood Control dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The crest of this masonry dam was in satisfactory condition. It is on good grade and good alignment. No flashboards are on the crest and water level in storage was about 1" above crest elevation.

The toe area in the bed of the stream was o.k.

The Gunitite covering on the downstream face of a portion of the masonry is beginning to deteriorate. This deterioration is typical and the condition does not endanger the dam.

Seepage was observed at the right side of the dam at the right abutment face just back of the downstream concrete training wall. The seepage appeared to be coming thru the abutment from the reservoir. The condition is okay for the present but should be watched for any increase in quantity of flow or for the occurrence of any settlement on the surface of the

ground at the right abutment area of the dam or behind the downstream training wall in front of the dam.

Each abutment of the dam consists of up upstream and downstream masonry wall filled between with earth. This earth fill was examined at each abutment and nowhere was there any evidence of settlement which might be caused by flow of water through and under the abutment.

In the opinion of the undersigned, the dam is safe and simply needs to be observed periodically for any evidence of increase in seepage at the right side or any settlement of earth at the right abutment.

In the opinion of our Board, it would be adviseable for your department personnel to observe the right abutment area of the dam from time to time, for any evidence of earth settlement behind the abutment wall or of increase in the rate of seepage. Should any settlement occur or an increase in seepage be observed, it would be adviseable for you to contact the County Hydraulic Engineer for another inspection of the dam.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____



Commonwealth of Massachusetts
County of Hampden
Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXXXXXX~~

Floyd M. Fradet

Stephen A. Moynahan

October 22, 1969

Monson Water Department
Town Office Annex
Monson, Massachusetts

Attention: Board of Water Commissioners

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Conant Brook, just downstream from the new Corp. of Engineers Flood Control dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The crest of this masonry dam was in satisfactory condition. It is on good grade and good alignment. No flashboards are on the crest and water level in storage was about 1" above crest elevation.

The toe area in the bed of the stream was o.k.

The Gunitite covering on the downstream face of a portion of the masonry is beginning to deteriorate. This deterioration is typical and the condition does not endanger the dam.

Seepage was observed at the right side of the dam at the right abutment face just back of the downstream concrete training wall. The seepage appeared to be coming thru the abutment from the reservoir. The condition is okay for the present but should be watched for any increase in quantity of flow or for the occurrence of any settlement on the surface of the

ground at the right abutment area of the dam or behind the downstream training wall in front of the dam.

Each abutment of the dam consists of up upstream and downstream masonry wall filled between with earth. This earth fill was examined at each abutment and nowhere was there any evidence of settlement which might be caused by flow of water through and under the abutment.

In the opinion of the undersigned, the dam is safe and simply needs to be observed periodically for any evidence of increase in seepage at the right side or any settlement of earth at the right abutment.

In the opinion of our Board, it would be adviseable for your department personnel to observe the right abutment area of the dam from time to time, for any evidence of earth settlement behind the abutment wall or of increase in the rate of seepage. Should any settlement occur or an increase in seepage be observed, it would be adviseable for you to contact the County Hydraulic Engineer for another inspection of the dam.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Moulton Dam



o Monson

Also see: Dam Report Section - Monson. See also next: "Moulton Dam, aka Moulton, WC Dam aka Smith Pond Dam - Upper aka Chicopee Brook Dam - Lower".

| | |
|-----------|-------------|
| City/Town | Monson |
| Dam | Moulton Dam |
| Name | Moulton |

Dec. 19, 1956

Board of Selectmen
Town Hall
Monson, Mass.

Gentlemen:

In accordance with Chapter 253 of the General Laws of the Commonwealth of Massachusetts, the County Hydraulic Engineer has made inspections of various dams throughout the Town of Monson. In his report he has noted that on Route #32 at the location of the small pond to the west of the roadway just upstream from the Moulton Dam on Chicopee Brook, the spillway for the small pond is thru a culvert having an opening protected with a horizontal bar rack. The spacing of the bar rack is quite fine and the rack itself could probably result in causing an overflow of pond water onto the roadway in time of heavy storm. Our engineer has pointed out the advisability of providing a better inlet arrangement at this culvert spillway in order to prevent plugging of the inlet by debris.

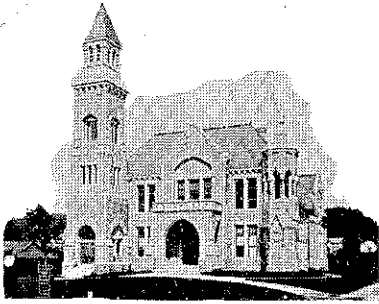
We are passing this information on to you for your consideration and action if the maintenance of this culvert and its inlet comes within your jurisdiction.

If you desire any further information on this matter, please do not hesitate to call upon us.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GHM/f



SELECTMEN and BOARD of PUBLIC WELFARE

Memorial Town Hall



Monson, Massachusetts

December 26, 1956

Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

We are in receipt of your letter of December 19, 1956 regarding the culvert under-neath Route 32 and the Moulton Dam located just westerly of Route 32.

Please be advised that the jurisdiction of the construction and maintenance of this culvert is under the supervision of the Massachusetts Department of Public Works, F. W. Guerin, District Highway Engineer, 403 Belmont Street, Worcester, Massachusetts.

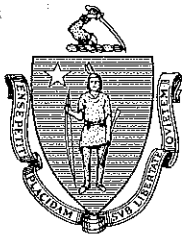
We suggest that the information be forwarded to his office so that he will be aware of the condition and may take steps to remedy it. As you may know, in this particular spot the road-way was washed out during the flood of August 1955.

Very truly yours,

Fredrick J. Sullivan, Jr.
Fredrick J. Riesel
Frank Carter
BOARD OF SELECTMEN

FJS:l

Copy of this letter mailed to George H. McDonnell,
County Hydraulic Engineer, on January 4, 1957.



The Commonwealth of Massachusetts
Department of Public Works

DISTRICT #3 OFFICE
403 BELMONT STREET, WORCESTER 4

January 11, 1957

MONSON

Board of County Commissioners,
Hampden County Court House,
37 Elm Street,
Springfield, Mass.

Gentlemen:-

This will acknowledge receipt of your letter to me dated January 9, 1957 having to do with a spillway located at a small pond upstream from Moulton Dam on Chicopee Brook in Monson, and I beg to advise that I will have this matter investigated and will submit a report to you on this matter at a later date.

Very truly yours,

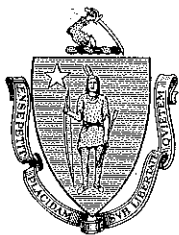
F. W. Guerin

FWG:Q
C-FFD

F. W. Guerin
District Highway Engineer

Received in Hampden Cty Comms' Office on Jan. 14, 1957.

Copy of this letter sent to George H. McDonnell, County Hydraulic Engineer, on January 15, 1957.



The Commonwealth of Massachusetts

Department of Public Works

January 29, 1957

DISTRICT #3 - 403 Belmont Street
Worcester, Massachusetts

MONSON

Board of County Commissioners
Hampden County Court House
Springfield, Massachusetts

Gentlemen:-

Under date of January 9, 1957 you wrote this office pertaining to condition at culvert that crosses the State Highway on Route 32 at a location of a small pond emptying eventually into Chicopee Brook.

This culvert is located at Station 12+66 on the Palmer to Monson State Highway and consists of a 5x5 stone box extended on the easterly side with a 5x5 concrete box, on the westerly side by a 5x5 concrete box and concrete spillway. The opening of the spillway is covered with a 2" iron grating.

After checking we find that the location of this spillway is outside of the old county layout and also the State Highway layout which is inside the county layout. A plan is herewith attached which shows these conditions.

Mr. Fred Sullivan, Chairman of the Board of Selectmen was contacted and the situation explained to him. He agrees that the source of the trouble is on private property and beyond the jurisdiction of this Department.

There is no doubt that the present grating is insufficient and that it will clog very easily, for that matter the first time it was looked at considerable brush and debris was clogging the opening and yesterday when we visited the site some one had removed the debris and the grating in order to give a free flow for the water.

Mr. Sullivan stated that he would take this matter up with his colleagues on the Board and also with your Board as to the proper method of handling this matter.

Very truly yours,

F. W. Guerin

F. W. Guerin
District Highway Engineer

FFD-W
C-FFD

A copy of this letter was sent to George H. McDonnell,
County Hydraulic Engineer, on January 31, 1957.

Chestnut St.
Monson, Mass.
Nov. 28, 1959

County Commissioners
Hampden Court House
37 Elm St.
Springfield, Mass.

Dear Sirs:

I would like to know if your office has a voice in matters pertaining to water ways, such as streams and ponds.

I own land along the Chicopee Brook in the vicinity of Chestnut Street bridge. During rain storms, the run off under this bridge is much slower than formerly, thereby, creating flood nuisance that never existed before. This is due to a condition created about 1/4 mile down stream from Chestnut Street bridge at William C. Moulton's pond situated along the east side of Palmer Rd. (Route 32), formerly known as Days Pond.

A few years ago Mr. Moulton earthy filled in the Chicopee Brook where it entered the south end of pond, thereby changing its course, the new course of brook is much smaller, this creates a stoppage at times of freshets, and also affects the flow under Chestnut St. bridge. Mr. Moulton has also earth filled 1/4 or better of his pond, the fill is the present site of Monson Repair Shop, Palmer Road, and also the site of Allen B. Robbins Trucking. (At the present time, they are continuing to fill in this pond.) This fill also helps to retard the flow of water under Chestnut Street bridge.

Mr. Moulton has also raised his spillway higher by building a concrete wall about 16" high on top of spillway, and about eighty (80) feet long. Dropping this spillway to where it belongs would greatly increase the flow capacity of water at Chestnut Street bridge.

I am the owner of a house situated close by this Highway Bridge. I believe a heavy rain would cause much damage to the bridge and Chestnut Street, and also would ruin my house and lot.

For several years, Mr. Moulton has kept the water gates open most of the time, I believe due to repairs of spillway.

At present, when pond is full of water, and we have medium heavy rain, Chestnut Street bridge just barely takes the water flow. I have lived here over fifty years, and know the water capacity at this bridge has been reduced greatly, due to conditions described in this letter.

It seems to me that your office could take steps to remedy this situation.

I will appreciate hearing from you.

Very truly yours,

A handwritten signature in cursive script that reads "Alfred W. Borgeson". The signature is fluid and extends to the right.

Alfred W. Borgeson

AWB:M

Copy of this letter sent to Mr. George H. McDonnell,
County Hydraulic Engineer, on November 30, 1959.

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
Dec. 18, 1959

Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Reference is made to a communication dated Nov. 28, 1959 and sent to your Board by Mr. Alfred W. Borgeson of Chestnut St., in Monson, Mass. Mr. Borgeson has been concerned recently over filling that has been done in the low land and bed of Chicopee Brook, as well as the fact that Mr. Moulton has activated his dam on Chicopee Brook, just upstream from the Church Mfg Co. pond.

I met with Mr. Borgeson on the afternoon of Dec. 17, 1959, and inspected the site in the field in his presence.

Mr. Borgeson lives on Chestnut Street, just to the east of the railroad tracks and Chicopee Brook. Near his home, Chicopee Brook passes under Chestnut Street. Mr. Borgeson claims that the normal level of Chicopee Brook has been raised and pointed out to me certain filling that has been done downstream of Chestnut Street and upstream of the Moulton dam. Apparently, this filling has all been done on property of Moulton and, much of the filling has been done some years ago.

The bed of Chicopee Brook has been shifted to the east but, this shift has apparently been made entirely on property of Moulton.

In recent years, the Moulton dam has been inactive and water of Chicopee Brook has passed thru the dam in the wheelhouse pit. Consequently, water level in the brook was low and any effect of the filling was not noticed upstream.

I pointed out to Mr. Borgeson that the work Mr. Moulton had done in connection with relocating Chicopee Brook and filling the low land was a matter that did not and, according to the law, could not come under County control. I pointed out to Mr. Borgeson that the problem at hand was one having to do with a waterway above a dam and consequently, any control would come thru

**TIGHE
& BOND CONSULTING ENGINEERS**

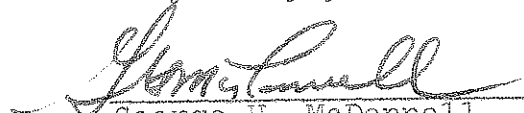
2.
CD Monson
Dec. 18, 1959

the Waterways Division of the Dept. of Public Works, Commonwealth of Massachusetts. I suggested that he write to the Waterways Division and also that he discuss the matter with the Board of Selectmen. I pointed out to Mr. Borgeson that any increase in water level that might subject property to flooding in time of storm or might endanger culverts and bridges could only come under your control when a dam is involved and the danger exists downstream due to the possible breaking of the dam.

I inspected the dam in the presence of Mr. Borgeson and pointed out to him that I would follow up the inspection of this dam in connection with a determination as to its safety and operation. I also agreed that I would determine whether or not the water level as ponded now by the dam was the same as the water level ponded years ago at this dam, when the water power was in use. A report on this matter will be submitted to you when I finish my investigation of conditions at the Moulton dam.

I am enclosing, for your consideration, a letter that could be sent to Mr. Borgeson, if you concur in its contents.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

GHM/cmb
enc.

Dec. 23, 1959

Mr. Wilfred W. Borgeson,
Chestnut Street
Monson, Mass.

Dear Mr. Borgeson:

Thank you for your letter of Nov. 28, 1959, pertaining to the problem of water level on Chicopee Brook, in Monson. The County Hydraulic Engineer has reported to us in connection with his findings in Monson and his conference with you, on the afternoon of Thursday, Dec. 17, 1959.

Under the provisions of the General Laws of Massachusetts, the County Commissioners can act when a dam forming a pond is in a condition whereby persons and property downstream are endangered thru the possible failure or breach of the dam. Matters having to do with the filling of a stream, the changing of the direction or location of a stream and, dumping into a stream do not come under County control.

In many instances, problems of this type do come under the control of the Division of Waterways, Department of Public Works of the Commonwealth of Massachusetts. Also, if municipal property is endangered, due to flooding of bridges or culverts, it is possible that Town authorities can take action where necessary to protect the public property.

Based upon the report submitted by the County Hydraulic Engineer, the only action our Board is empowered to take is to determine the safety of the dam involved and make recommendations to the Owner for improvements in connection therewith. If the dam endangers persons and property downstream, we can then act, under the provisions of the General Laws, to require the necessary repairs be made. However, anything that may be required at the dam apparently will not solve your problem of filling in the brook and changing direction of the stream. If the dam downstream is found to be unsafe, then action can be taken to cause the pond to be drained. However, if the owner complies with the recommendations of the County Hydraulic Engineer as approved by our Board, then that owner has the right to maintain and operate his dam.

I would suggest that if you do contact the Waterways Division

2.
Dec. 23, 1959

of the Commonwealth or the Board of Selectmen at Monson, that you mention to them of your meeting with the County Hydraulic Engineer. I know he would be pleased to confer on the matter with the Town authorities or representatives of the Division of Waterways if they desire a conference on the matter.

This Board will be pleased to assist you in any way possible and will direct the County Hydraulic Engineer to advise you and meet with you as necessary insofar as the County has jurisdiction under your problem.

Very truly yours

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson

September 2, 1964

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

The undersigned received a request from Mr. Alfred D. Maynard of Monson to examine conditions in a small brook that discharges into Chicopee Brook adjacent to Chestnut Street in the Town of Monson. The brook has three main branches that drain a portion of the westerly slopes of East Hill south of Brimfield Road. The three branches of the brook join together east of Bethany Road and the single main stream formed then passes under Bethany Road in a 5 ft. culvert and a short distance downstream thru a 4 ft. culvert adjacent to property of Maynard to discharge into Chicopee Brook.

Mr. Maynard has been concerned over the fact that in recent weeks, and for the first time in his memory, no water has been flowing in the brook on or adjacent to his property. On investigating conditions upstream, he found that the brook is being diverted from its natural channel into a man-made swimming and recreational pool on property of a landowner just above Bethany Road. The pool has been excavated in what is apparently a pervious sand and gravel. The full dry weather flow of the brook is diverted via a plastic pipeline to the pool and the pool, though it has an overflow pipe leading back to the brook, has never filled up and has apparently reached a point of stabilization where the quantity of dry weather inflow equals the quantity of seepage into the ground. In short, the user of the water in the brook upstream of Mr. Maynard is making use of all of the water on his property and is not returning any of it to the brook.

Mr. Maynard felt that the matter might be one coming under County jurisdiction and he requested that action be taken, if possible, to require the upstream landowner to return the water to the brook under the usual riparian rights wherein water used by an upstream landowner is generally returned to the stream undiminished within practical limits in quantity or quality.

I pointed out to Mr. Maynard that since the pool involved is an artificial pool and has been excavated outside of the brook proper, the pool thus formed does not come under County jurisdiction. The only part of an installation of this sort that would come under County jurisdiction would be the diversion dam in the main brook.

I observed the diversion facilities in the field and in my opinion, these facilities do not constitute a dam.

The land owner diverting the water has constructed an intake box in the brook and has located it between boulders in such a way that the low flow of the brook is diverted into the box and then a plastic pipeline carries this flow off to the pool located on the left side of the brook and downstream of the diversion point. The diversion box and facility does not dam up the brook and in fact, it does not add to the unevenness of the brook bed itself in that the bed is very rocky and bouldery in its natural state and there are many small natural potholes upstream as well as downstream of the diversion facility.

On the day I observed the diversion facility in operation, Friday, August 28, 1964, I noted a reasonably good dry weather flow in the brook upstream of the diversion facility but all of the water of the brook was taken into the diversion box and carried thru the plastic pipeline to the pool.

I pointed out to Mr. Maynard that insofar as I could see, the County has no jurisdiction in the case at hand and that it is one of civil action wherein a downstream property owner who has the flow of a brook removed by action of an upstream property owner can take legal action to have the upstream owner required to pass on water for his downstream use.

Mr. Maynard also discussed a problem with me regarding the filling in of Chicopee Brook upstream of the Moulton Dam and adjacent to his property northerly of Chestnut Street. Land owner or owners on the left bank of Chicopee Brook have been dumping fill into the valley of the brook and forcing the brook in an easterly direction from what Mr. Maynard claims was the original thread of the stream and a sideline of his property.

I informed Mr. Maynard that again the matter of stream movement one way or another does not come under County jurisdiction unless the work involves the ponding of water and the creation of a condition dangerous to persons and property downstream. I suggested that he take the matter up either with the Division of Waterways of the Commonwealth of Massachusetts, the Corps of Engineers, or his Attorney with the thought in mind of bringing civil action to prevent any loss of his property by shifting of the brook easterly thru filling along the westerly

side of the stream if the Federal or State Agency can offer no aid.

Mr. Maynard wanted to know what action the County could take in his behalf in connection with the stream flow capacity of a culvert and a bridge opening in the Valley of Chicopee Brook under Chestnut Street adjacent to his home. Chicopee Brook flows northerly under Chestnut Street and the main thread of the stream passes under the street just westerly of his home thru a bridged opening. There is a second passageway for water under and across Chestnut Street to the west that is formed by a corrugated metal culvert arch. This arch has been blocked up with material deposited apparently by flood flows at and downstream of the culvert. The blockage is relatively high and only a small cross section near the upper portion of the arch is available for free flow of the stream. Also, in the bed of the stream at the bridge, some material has been deposited and the cross section for stream flow has been reduced slightly.

The undersigned pointed out to Mr. Maynard that culvert capacities and cross sectional areas under bridges for stream flow are matters that are handled by the Waterways Division of the Massachusetts Department of Public Works or the Controlling department of the Town involved. In the case of Monson, I pointed out to Mr. Maynard that the matter should probably be taken up with the Board of Selectmen and a request made that the culvert and bridge opening be cleaned if he is concerned over the possibility of water backing up on his property in time of flood flow.

In regard to the condition of the culvert and the bridge under Chestnut Street, Mr. Maynard also pointed out that the small feeder brook first herein discussed that parallels Chestnut Street after crossing onto Bethany Road and that discharges to Chicopee Brook at his property, is conveyed under Bethany Road in a 5 ft. diameter culvert but is then conveyed under an access ramp to a nursery area on his property in a Town installed culvert that is approximately 4 ft. in diameter. Additional surface water enters the brook from the intersection of Bethany Road and Chestnut Street downstream of the 5 ft. culvert. Mr. Maynard feels that a larger culvert should be installed at his access roadway to his nursery area.

Again in this case, I pointed out to Mr. Maynard that this is a culvert matter, not one having to do with dams, and consequently, it should be taken up with Town Officials.

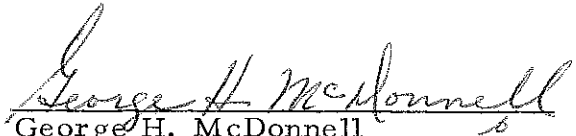
Mr. Maynard requested that a communication be sent to him containing the

**TIGHE
& BOND CONSULTING ENGINEERS**

various recommendations and the advice given by the undersigned at the time of our conference.

If you concur in the contents of the enclosed suggested communication, it could be signed by your Board and forwarded.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mg

September 9, 1964

Mr. Alfred D. Maynard
Chestnut Street
Monson, Massachusetts

Dear Sir:

We have received a written report from the County Hydraulic Engineer relative to the various matters discussed with him on Friday afternoon, August 28, 1964.

At this conference, the County Hydraulic Engineer reviewed certain matters relating to the drying up of a small feeder brook that passes thru your property and discharges into Chicopee Brook. He also discussed with you a problem relating to filling being carried on along the westerly side of Chicopee Brook and the creation of a condition wherein the Brook course may have been changed as the result of this filling, to cause the flow of the water to be shifted onto property owned by you.

The matter of an arch culvert and bridge on Chestnut Street and culverts carrying the feeder brook to Chicopee Brook were also discussed.

In brief, it is the opinion of our Board that the County Hydraulic Engineer advised you correctly when he pointed out that the diversion of water from the small feeder brook by an upstream land owner is a matter of civil action and one in which the County has no jurisdiction. As reported by the County Hydraulic Engineer, an upstream land owner has caused diversion of the feeder brook water from the brook bed to an excavation that apparently has been dug in pervious material. Diversion is taking place without the presence of a dam and the diversion of the water into the excavation resulted in all of the dry weather flow of the brook being removed from the brook valley proper on August 28th, the day of inspection, and discharged, thru seepage action, into the ground at the excavation. Your observations show that this condition has been experienced for some time.

This construction and diversion has resulted in no water flowing in the feeder brook as it passes thru your property. In this matter, since there is no dam involved, and since the lives and safety of persons and property downstream are not endangered as a result of this diversion, there is no action the County can

take under the laws of the Commonwealth of Massachusetts. However, if you wish to have the flow of the stream returned so as to make use of the water in connection with the nursery and related work on your property, it is suggested that you discuss this matter with your Attorney.

In regard to your problem of Chicopee Brook being a westerly property line of your land and the fact that it is being filled on its westerly shore with the possibility of the brook being pushed over onto your property, again, this is a matter for civil action or possibly a matter for the Division of Waterways of the Commonwealth of Massachusetts or the Corps of Engineers. In any event, the County Commissioners have no jurisdiction and cannot act in this case.

In regard to the culvert and the bridge for conveying Chicopee Brook water under and across Chestnut Street at a point westerly of your home, the County Hydraulic Engineer pointed out that the corrugated iron arch culvert has its capacity reduced considerably by materials deposited in and downstream of the culvert. Also, at the bridge, the opening for passage of water is reduced by deposits of sand and gravel in the bed of the stream.

The matter of culvert maintenance comes under control of the Town of Monson and it is suggested that you discuss this matter with either the Superintendent of the Highway Department or the Board of Selectmen. You could point out to them that restriction of flow because of deposits in and beyond the culvert or the bridge could reduce the ability of these facilities to pass flood flows and consequently water in the brook could rise to flood your property and damage your nursery area.

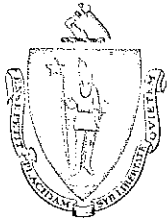
Regarding the culvert under Bethany Road and under the access ramp or roadway to your property on the southerly side of Chestnut Street near your house, and particularly regarding the fact that the upstream culvert at Bethany Road is a 5 ft. culvert while the one downstream is only a 4 ft. culvert, again this is a matter over which the County has no jurisdiction and it should be discussed with the Town Officials as mentioned hereinbefore in the case of Chicopee Brook culvert and bridge. Generally speaking, culverts are sized larger and larger as one proceeds downstream. However, it is possible that for some particular reason, probably because of the fact that the lower culvert does not carry public traffic, the smaller culvert has been used at the ramp or access roadway to your nursery area. Loss of this culvert because of flood flows that might exceed its capacity, would not necessarily have any effect on vehicular traffic passing Chestnut Street. However, it is possible that it could cause flooding on your property and this problem could be brought to the attention of the proper officials of the Town of Monson.

We are sorry that we cannot help you in any way with these four problems since the laws of the Commonwealth do not give our Board any jurisdiction in any of the four cases presented by you.

If you have any further question in connection with these matters, please feel free to write or call this Board or to request the advice of the County Hydraulic Engineer.

Very truly yours,

Board of County Commissioners



Commonwealth of Massachusetts

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County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph P. Walsh
Floyd M. Fradet

October 16, 1968

Mr. W. C. Moulton
Palmer Lower Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook, upstream from the Church Manufacturing Company dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is in very poor condition. A report on the dam was submitted on April 8, 1968, and a letter was sent to the owner of the dam by your Board on April 10, 1968. At that time, the owner was advised that if he did not plan to constructively use the dam or water power related thereto, the structure should be breached in such a way that no water would be stored.

At the time of the most recent inspection of the dam on September 26, 1968, the structure was noted to be in the same poor condition as previously reported. However, the pond formed by the dam was empty. Water was leaking thru the water wheel structure at a rate equal to the inflow of Chicopee Brook.

The bottom of the pond is in general, only from 1 ft. to 2 ft. below the crest of the dam and thus, even when the pond is filled to normal capacity, the quantity of water stored is negligible. The undersigned is of the opinion that this dam will fail sometime in the not too distant future, but that when it does fail, there will be little to no danger as a

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-2-

result of the released water. If failure should occur during flood flow conditions, the failure would never be observed until after water in the stream receded to normal elevation.

I am of the opinion that the owner should again be advised of the condition of the dam and that he should notify you of what action he plans to take, if any, in connection with repairing and properly maintaining the dam or in breaching the structure."

Will you kindly notify our Board of your plans for this old dam. If you do not plan constructive use of the dam or water power related thereto, you should give consideration to breaching the dam in such a way that should it suddenly fail, the quantity of water released will be at a minimum.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Moulton Dam aka Moulton, W C Dam aka Smith Pond Dam - Upper aka Chicopee Brook Dam - Lower



1926 Monson

Dams located on Smith Pond, Chicopee Brook. Also see: Smith Dam aka Smith Pond Dam.

| | |
|-----------|----------------------------|
| City/Town | Monson |
| Dam | Chicopee Brook Dam - Lower |
| Dam | Moulton Dam |
| Dam | Moulton, W C Dam |
| Dam | Smith Pond Dam - Upper |
| Name | Moulton, W C |
| Water | Chicopee Brook |

Page 43 of Report

W.C. Moulton,
Monson, Mass.

you are notified that your
upper or Smith Pond dam, located on Chicopee Brook
so called in the Town of Monson, etc.

"The sawmill is now abandoned
and in a dilapidated condition with penstock
and gates connected therewith broken down
and in a state of debris.

The dam itself is in poor condition
and requires repairing, especially the
crest. The pond is used as an ice pond, and if
it is to remain such, it is recommended
that the structure be repaired and made
safe. Otherwise, an opening should be
made through the structure and the pond
drawn down."

Now, therefore, etc.

March 3, 1926

W. C. Moulton,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your upper or Smith Pond dam, located on Chicopee Brook, so-called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The sawmill is now abandoned and in a dilapidated condition with penstock and gates connected therewith broken down and in a state of debris.

The dam itself is in poor condition and requires repairing, especially the crest. The pond is used as an ice pond, and if it is to remain such, it is recommended that the structure be repaired and made safe. Otherwise, an opening should be made through the structure and the pond drawn down."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

W.C. Moulton,

Manson, Mass.

you are notified that your lower dam,
located on Chicopee Brook so called in the Town
of Manson, etc.

"The dam was overhauled and
repaired about five years ago. It needs
some repairing again, as some of the
stones in the facing have become loose
and are falling out. These stones should
be reset in place."

Now, therefore, etc.

March 10, 1926

W. C. Moulton,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your lower dam, located on Chicopee Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The dam was overhauled and repaired about five years ago. It needs some repairing again, as some of the stones in the facing have become loose and are falling out. These stones should be reset in place."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

November 14, 1951

W. C. Moulton
Palmer Lower Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook just upstream from the Church Manufacturing Company Dam, and your dam located on the tributary to Chicopee Brook just westerly of Palmer Lower Road and immediately upstream from your previously described dam, have been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

Chicopee Brook Dam: "It was noted that flashboards were still in place on this dam and it appeared that the power unit was not in use. If power is not to be developed at the dam throughout the Winter and Spring months, it would be advisable to remove the flashboards during these two seasons."

Tributary to Chicopee Brook Dam: "Leaves and debris partially block the influent to the culvert under Palmer lower road. Settlement of earth over the culvert directly in front of the dam indicates possible failure of the culvert underground. This condition should be investigated."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

W. C. Moulton

13-11-51

January 6, 1954

W. C. Moulton
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that you dam located on Chicopee Brook just upstream from the Church Manufacturing Co and your dam on the small tributary to Chicopee Brook just upstream from this above described dam have been recently inspected by our engineer, and your attention is called to the following conditions noted and recommendations made by him:

Chicopee Brook Dam: This dam seems to be becoming more and more dilapidated with the apparent loss of additional stone masonry from the dam. There is little danger of any damage occurring should a section of the dam become breached, since the structure would not go out all at once and also since the pond now formed is not too large in area and is very shallow. It would be advisable to notify the owner of the approaching need for repairs to the structure and the replacement of stone masonry lost from the dam as well as the adjustment or realignment of any stones in the dam that have shifted from their original location.

Tributary Dam: There is settlement of the ground between the road shoulder and the overflow structure of the dam. This settlement indicates underground trouble and perhaps a break in the culvert with leakage of water and soil particles into the culvert through this break or opening. This condition should be investigated and corrected as necessary if the existing possible danger of the loss of the road shoulder is to be eliminated.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____ Chairman

November 10, 1954

7

Mr. W. C. Moulton
Monson
Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook in Monson, has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"The alignment of the stone masonry seems to be growing worse each year. If the dam is to be maintained, it probably would be wise to draw down the pond for a complete inspection and for the making of any repairs found necessary. Though the dam is low in height and the pond formed not great, and thus the possibility of damage due to loss of the dam not serious, in order to guarantee the safety of the structure, it is recommended that it be dewatered for a complete inspection and to determine repairs necessary to guarantee its safe condition. This work should be done within the next six months and it is recommended that the Owner notify your Board when the gate will be opened and the pond drained so that an inspection can be made of the dewatered dam."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____ Chairman

April 10, 1968

Mr. W. C. Moulton
Palmer Lower Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on Chicopee Brook, upstream from the Church Manufacturing Company dam, has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

The following is recommended to you in view of the conditions noted at your dam at the time of the most recent inspection and in view of our communication to you of November 2, 1966.

The dam is in very poor condition. The concrete central section is quite badly eroded and stone block masonry to the right of the concrete portion of the dam is unraveling and stones are no longer properly supported.

Trees growing from the right abutment and along the right dike endanger the dam. These trees have become quite large and if one or more should be blown over during a heavy windstorm, the dirt which could be displaced as the roots are pulled from the ground could cause a breach in the dike and the sudden release of stored water.

It is apparent that the dam is not being used for power purposes and that there is little likelihood of it being used in the future.

If you do feel that the hydraulic power at the site of your dam has sufficient value to make it worthwhile to keep the dam, then the structure should be strengthened, repaired and made safe. If you do not plan to constructively use the dam or water power related thereto, then the structure should be breached in such a way that no water will be stored.

We again request that you notify us of what action you plan to take in connection with either repairing and properly maintaining the dam, or breaching the structure.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
June 4, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Re: Moulton Dam
Monson

Gentlemen:

In regard to the above subject dam on Chicopee Brook in Monson, more than one month has passed since a communication was sent to the owner of the dam asking that he advise your Board of what action he plans to take in connection with either repairing the dam or breaching the structure.

I have heard nothing from the owner and assume that he has not answered your letter. I would recommend that a copy of the communication dated April 10, 1968, be sent to Mr. Moulton by either Registered or Certified Mail asking him to please reply within a period of 30 calendar days.

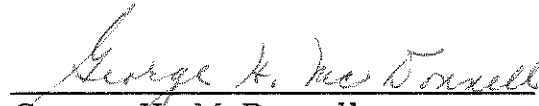
In regard to this dam, it has been pointed out in previous reports that very little water is stored since nearly all of the volume of the storage basin has been filled in with sand, gravel, debris, etc., washed down from upstream during time of past flood flow conditions. Immediately downstream there is located the pond of the Church Manufacturing Co., and it is doubtful that loss of the Moulton Dam would increase water level in the Church Manufacturing Co. pond by more than 3" to 4". The chance of damage to property by failure of the dam is very minor. However, should the dam fail under normal stream flow conditions and children be playing along the stream between the Moulton Dam and the Church Manufacturing Co. pond, there would be the possibility of these children being either injured or drowned.

TIGHE
& BOND CONSULTING ENGINEERS

-2-

It is my opinion that the owner should show some interest in either making this dam safe and improving conditions along the dike, or he should breach the dam.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

Bradway Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------|
| City/Town | Monson |
| Dam | Bradway Dam |
| Name | Bradway, O E |

MONSON
D13039

BRADWAY DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Overlook Farm Dam



1952 Monson

Dam forming small pond adjacent to Boston Road- Route 20 and on the opposite side of Route 20 from the "Overlook Farm".

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Overlook Farm Dam |
| Name | Overlook Farm |
| Streets | Route 20 |
| Streets | Boston Road |

December 17, 1952

Overlook Farm
Boston Road
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located southerly of the Boston Road across this road from your house has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

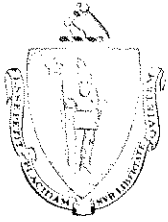
"The spillway channel has been reconstructed in concrete but high flows plus some leakage has caused the fill of the dam to be washed out beside the spillway channel. The spillway channel walls should be raised in height to confine the flow to the paved area and the leakage should be plugged."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____ Chairman



Commonwealth of Massachusetts

COPY

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph H. Walsh
Floyd W. Fradet

October 16, 1968

Overlook Farm
Boston Road - Route 20
Monson, Massachusetts

Gentlemen:

The County Hydraulic Engineer, in making inspections of dams situated in the Town of Monson and coming under County jurisdiction per Chapter 253 of the General Laws of the Commonwealth of Massachusetts, inspected the dam forming a small pond adjacent to Route 20 and on the opposite side of Route 20 from your farm. County records indicate that this dam and pond were formerly your property and they may still be owned as part of your farm.

The report of the County Hydraulic Engineer is as follows:

"The embankment of this small dam is again over-run with a thick growth of brush and weeds. The spillway is in poor condition in that the asphalt paving has become broken and a hole has formed under the paving. Any water passing through the spillway will flow into the hole under the spillway through the break in the paving and will eventually cause loss of the dam.

This dam receives very little maintenance and the owner of the structure should take the necessary steps to protect his investment by repairing the spillway and properly maintaining the embankment forming the dam.

This dam is small in size, being only about 5 feet in height, it impounds an estimated one-half million gallons and the drainage area is considerably less than one square mile. Consequently, the dam

COPY

-2-

does not come under County jurisdiction but is inspected periodically since its location is directly beside State Highway Route 20.

It is recommended that the owner be advised of the condition of the dam. "

This report is sent to you for information purposes only and for any action you care to take to protect the investment in the pond and dam.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Paradise Lake Dam aka Eaton, G C, Dam



1949 Monson

Dam located at Paradise Lake. Also see: Paradise Lake Dam aka Eaton Dam.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Eaton, G C Dam |
| Dam | Paradise Lake Dam |
| Name | Eaton, Grover C |
| Water | Paradise Lake |
| Water | Paradise Pond |

July 7, 1949

Paradise Pond - Dam owned by a Mr. Eaton

Mr. Hasenjager 1 mile below not receiving water.

His property borders on the brook for 1 mile.

Miss Neilson telephoned Mr. Bond and after going through his records found nothing on the above matter.

*See Engineer McDonnell's letter
dated October 3, 1949.*

JAMES L. TIGHE
PHILIP E. BOND
TELEPHONE
HOLYOKE 5525

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
WATER POWER
DAMS

October 3, 1949

The Hon. The Board of County Comm'rs
Hampden County Court House
Springfield, Mass.

Attn: Thomas F. Sullivan, Chm.

Gentlemen:

Re: Complaint of a Mr.
Hasanjager, Monson

Mr. Hasanjager of Monson apparantly owns land downstream from Paradise Lake. The brook flowing through his land became dry during the draught of this summer, and in August Mr. Hasanjager requested that the Selectmen of the Town take action to require the owner of Paradise Lake, a Mr. Eaton, to let down stored water, in order to provide a flow in the brook. It seems that Mr. Hasanjager waters his cattle at the brook in question, and was anxious to maintain his source of supply.

The undersigned verbally advised the Selectmen that he could take no definite action in this case, but would offer any advise and help, to the parties concerned, in order to reach a solution to the problem that might be agreeable to all. A fall of rain occurred within a day or two after the original complaint was discussed, and since that time there has been no further request for action.

I attended a meeting of the Selectmen on September 28, 1949, and learned that they have had no further complaint from Mr. Hasanjager, and assume that the problem has been settled naturally, as a result of the recent rainfall.

Very truly yours,

TIGHE & BOND

By 
G. H. McDonnell

April 10, 1968

Mr. G. C. Eaton
Paradise Lake
Monson, Massachusetts

Dear Sir:

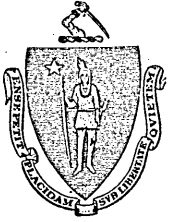
In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located at Paradise Lake in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

The cause of the crack in the left stone masonry should be investigated and corrective action taken. Perhaps water is leaking through the floor of the spillway at the location of the original crack and this leakage together with seepage reported previously may be causing some settlement of soil under the spillway.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXXXXXX~~

Floyd W. Fradet

Stephen A. Moynahan

October 22, 1969

Monson Dam

Mrs. Grover C. Eaton
61 Washington Road
Springfield, Massachusetts

Dear Mrs. Eaton:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located at Paradise Lake in Monson has been recently inspected by our County Hydraulic Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The embankment of this dam is found to be satisfactory. The downstream stone masonry wall is in good condition and there was no toe seepage along the base.

The spillway concrete sidewalls were satisfactory. Sections of cut stone were noted lying beside the spillway channel to the right side of the spillway. Water was running thru the spillway. There was no stoplogs at the crest opening and water level in the pond was at crest elevation.

Minor cracks still exist on the floor of the spillway and these should be sealed. Any new cracks developing should be cut out, repaired and sealed as soon as they appear. Cracks in the floor of the spillway will result in water running thru the cracks and under the spillway causing undermining of the masonry. Any undermining observed under the spillway floor should be filled with a good, rich cement grout.

At the entrance to the spillway, on the left side of the spillway

channel while facing downstream and at the shoreline, the stone masonry is badly eroded and should be repaired.

In the opinion of the undersigned, the dam is safe. However, if repairs and maintenance are not done, then the dam, particularly the spillway facility, will begin to deteriorate."

Recommendations contained in the report of the County Hydraulic Engineer should be followed. The dam, particularly the spillway facility, should be properly maintained to keep the structure safe, to prevent its deterioration and to protect your investment in the structure.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Phillips Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------|
| City/Town | Monson |
| Dam | Phillips Dam |
| Name | Phillips |

MONSON
D13042

PHILLIPS DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Platt Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|------------------|
| City/Town | Monson |
| Dam | Platt Dam |
| Name | Platt, Warren Jr |
| Name | Ricci |

MONSON
D13043

PLATT DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Pulpit Rock Lake Dams



1956 Monson

Three dams : West Dam, Small Dam & New Concrete Dam. Two dams impound water at Pulpit Rock Lake and a small dam downstream of the westerly outlet. Also see: Dam Report Section - Monson. Also see: Pulpit Rock Pond Dam - Lower aka Eugbee Dam. See also: County Roads Plan #17 (1956) "Pulpit Rock Farm Dam".

City/Town Monson

| | |
|-------|-------------------------------------|
| Dam | Pulpit Rock Lake Dams |
| Name | Pulpit Rock Farms Inc |
| Name | Christianson, Edward |
| Name | Third National Bank & Trust Company |
| Name | Cox, William W |
| Name | R C A Realty Inc |
| Water | Pulpit Rock Pond |

CD Monson

Jan. 14, 1956

Pulpit Rock Farms, Inc.,
85 Oakland Street
Springfield, Massachusetts

Att: H. E. MacIntosh, Pres.

Gentlemen:

Reference is made to your dam newly constructed in Monson. Will you kindly notify the undersigned of the name and address, as well as the telephone number of the person responsible for the operation of this dam? The person who is responsible should be able to remove flashboards, stoplogs and operate the gate, as necessary in time of flood or danger of flood. He should recognize the problems downstream if the gate is opened full and all flashboards are removed suddenly. By releasing too much water too fast an artificial flood can be created downstream. The person designated to operate the dam should be informed of the County jurisdiction over operation of the dam.

Flashboards should be removed from the dam from late Summer thru the Spring months. When last inspected the flashboards were in place on the dam. Will you kindly have these boards removed and stored until after the Spring runoff? Ordinarily, the flashboards can be on a dam from May 1st until about September 15th of each year. Otherwise, the flashboards should be in storage and the crest of the dam available for full overflow.

Such a procedure increases the safety at the dam and decreases the chance of losing flashboards and flashboard pins each Fall and Spring, when the boards would be washed out by high flows.

When you remove the flashboards will you kindly send one pin to this office in order that we may test the pin to be certain the flashboards will fail as designed?

Very truly yours

George H. McDonnell
County Hydraulic Engineer

GHM/cmb

Sept. 14, 1956

Durkee, White & Towne
1694 Main St., Rm. 440
Springfield, Mass.

Att: Edw. N. Chapdelaine

Gentlemen:

In reference to your letter of Sept. 12, 1956, and to your drawing showing the revisions at Pulpit Rock Dam #1, please be advised that we have reviewed this plan and recommend certain changes as follows:

The cross section of the wall, as proposed on the right embankment, indicates that all reinforcement is to be placed at the outside face of this wall. Based upon the load to be resisted by this construction, it would seem to the undersigned that the steel reinforcement is not adequate or properly placed. Will you kindly check this steel design to be certain that the wall will not crack or overturn.

In the basic and original design there was no detail of the wall that is to be the right abutment wall of the dam. A review of this wall indicates that the reinforcement is probably located erroneously. However, there is no large cross sectional drawing of this wall to definitely indicate dimension and detail. You should be certain that your contractor knows the proper location and the proper procedure for installing the reinforcing in these abutment walls.

On the plan of the revisions you indicate that the soil to be placed behind the wall is to meet earth-fill dam requirements and the material is to be well-graded and shall be a gravel-sand-clay mixture with optimum moisture. The portion of the earth embankment that is placed directly against the back of the masonry wall should be an impervious material for the central third of the construction. Upstream of the central third a semi-impervious to sandy material would be satisfactory against the wall, while downstream of the central third it would be suitable to place graded gravel in order that there might be drainage for any seepage that does get through the impervious section.

All materials should be placed at optimum moisture and compacted.

In tying in the new fill with the old embankment, a key slot should be cut in the old embankment to tie the new fill into the old fill.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GMM/f

County

CD Monson
Sept. 14, 1956

Collins Engineering Co.
1562 Main St.
Springfield, Mass.

Gentlemen:

Reference is made to the plans and specifications filed with the County for the work at the C. F. Church Mfg. Co. in Monson, Mass. The undersigned discussed this work with you at this office and at that time it was requested that the plans and specifications being filed with the County be held at this office when submitted for review and recommendations until such time as you notified the undersigned that the scheme as shown on the plans was to be followed through by the Owner.

To this date I have heard nothing further from you and am still holding the filed plans. Will you kindly notify me what the disposition of these plans will be as soon as you have determined the wishes of your client.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/f

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Monson
Sept. 17, 1956

The Hon. the Board of County Commissioners
Hampden County Court House
31 Elm Street
Springfield, Mass.


Gentlemen:

Enclosed herewith please find a copy of the letter sent to the engineer on the Pulpit Rock Dam in Monson. This is in connection with a review of a preliminary plan that he has submitted to this office for review of the undersigned regarding a change in the construction on the right abutment. When and if the final plan is prepared for this change, then such plan and revised specifications would be submitted for review by your Board.

Also enclosed is a copy of a letter sent to the Collins Engineering Co. pointing out to them that the filed plans and specifications of the proposed work at the C. F. Church Mfg. in Monson are still being held at this office as per their request.

The enclosed two letters are self-explanatory.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/f

COPY

C.D. Monson
Jan. 7, 1957

Pulpit Rock Farm, Inc.
85 Oakland St.
Springfield, Mass.

Att: H. E. McIntosh, President

Dear Sir:

Reference is made to your letter of Jan. 2, 1957, and the list of extras amounting to \$5,920 in connection with the construction of your dam in Monson.

The first item listed is in the amount of \$1,350 and covers grouted riprap. This grouted riprap was placed on the left embankment just downstream of the new dam to form a transition section between the old spillway and downstream of the new spillway. In a letter written to you on Aug. 2, 1956, on page 2, the undersigned pointed out the need for extreme care in constructing this portion of the project and in being certain that the riprap was heavy and properly placed. From this letter we quote:

"Though the plan does not call for any special treatment to this riprap, this stone must be well placed and properly tied together so that the overflowing water will not cause movement of the stone, the undermining of the old spillway chute and the loss of the old spillway. When this riprap is placed it should be massive in size, it should be placed carefully in layers and it should be tied together throughout the entire mass with a strong cement grout poured and brushed into all voids of the entire riprap mass".

In connection with the second item in the amount of \$250.00, regarding the thickening of the retaining wall, the abutment wall on the right side of the dam was shown on the approved plans without presenting any detail of the wall construction. Subsequent checking of this wall during construction showed that detailed drawings and analyses of loads would require a thickening of the wall in approximately the central third to one-half the length of the wall in order to provide strength enough to withstand the pressure of the earth from behind. This thickening was done along the entire length of the wall, as I recall, due to the fact that it was easier and simpler for the contractor to widen his form space for the full length of the wall.

The third and fourth items on the extra list total \$1,300 and have to do with the replacement of the retaining wall, so-called, and the extra excavation related thereto. The County had no interest in this matter other than to see that this wall was properly replaced following its failure during the construction of the dam. During the construction of the dam a portion of the old concrete buried wall failed and slid into the excavation. The failure required its replacement with an impervious section. The construction carried on at this east abutment was a direct result of the wall failure and, consequently, was not an item concerning the undersigned other than insofar as being certain that a good watertight wall was constructed in its place.

The items of \$450, \$275, and \$370 having to do with extra excavation for stone at the base of the dam, placing of stone and grouting of the stone, were mentioned in our letters to you dated July 12, 1956, and also dated July 27, 1956. The material at the foundation level of the dam was clay-like in nature and quite soft and wet when worked on. We pointed out to the contractor in the field, and we called your attention to the conditions in the above-mentioned letters, wherein we thought it advisable that the foundation should be stabilized and consolidated by the use of gravel placed on the foundation before pouring of the concrete. We pointed out in our letters that the gravel could then be made impervious by flushing in concrete grout ahead of the actual pouring of the concrete. Since cement grout would be flushed into the gravel, any gravel used should be a washed gravel or broken stones.

It is my understanding that the contractor feels this work is an extra item and thus should be considered for payment because of extra work involved.

The last item on the list of extras is \$925 for sheet piling and the list mentions that the requested cost is for driving only. In regard to the sheet piling, the contractor requested approval for the use of sheet piling in place of the dug and concrete-filled trench called for on the plan.

Upon receiving this verbal request, the undersigned approved the use of the sheet piling. The use of the sheet piling has no doubt improved the quality of the construction. In any event, the piling was installed at the request of the contractor.

We wish to call your attention to the fact that we have stated herein the reasons why the various work listed in the extra work was done at the dam insofar as the undersigned knows and is concerned. The undersigned cannot take any stand in determining the dollar value of any of this work nor take any part in inter-

C. D. Monson
Jan. 7, 1957, Cont.

preting the contract between yourself and the contractor as to payment for extra items of work. Any interpretation of the contract and any determination of the value of the extras would naturally be the responsibility and a service to be rendered by your own Engineer.

For the matter of clarification, it would be well for the undersigned to point out that plans and specifications when approved, are approved based upon general conditions shown and conditions as then known in the field. There is very rarely a case when a dam or any other project can be constructed without one or more change orders or some changes being needed before completion of the work. As an example, the foundation of the dam required stabilization before concrete of the mass section could be poured. The need for stabilization was only determined following construction being carried on to the point where excavation had been or was nearly completed.

The interest of the County Engineer in this project, as on any project of this nature, is to be certain that a sound and safe dam is constructed. Changes necessary to accomplish this end are recommended and at times required as the work progresses. The final agreement between the owner and the contractor as to any payment for these changes is a matter, as mentioned hereinbefore, to be discussed and arbitrated between you, the Owner, the contractor and your Engineer.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

CHN/f

WATER SUPPLY

SEWERAGE

SEWAGE DISPOSAL

STRUCTURAL ENGINEERING

ELECTRICAL ENGINEERING

TIGHE & BOND, INC.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS

HIGHWAYS & BRIDGES

HOUSING DEVELOPMENT

WASTE DISPOSAL

CD-Monson


Jan. 11, 1957

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Enclosed please find a copy of a communication sent to Mr. H. E. McIntosh of the Pulpit Rock Farm, Inc., regarding his dam in Monson. This dam was recently completed and Mr. McIntosh wrote to me regarding extra work claimed by the contractor as a result of directives from the undersigned. The letter is self explanatory and describes in brief each of the items and explains why the item was completed or required, as the case may be, by the undersigned.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

Enc.
GHM/cmb

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, INC.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Monson

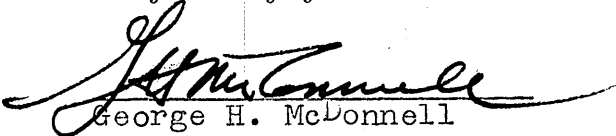
Jan. 14, 1957.

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Enclosed please find a copy of a communication regarding the Pulpit Rock Dam. The contents of this letter are self explanatory.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

Enc.
GHM/cmb

CD Monson
May 13, 1957

Pulpit Rock Farm, Inc.,
85 Oakland Street
Springfield, Mass.

Att: H. B. MacIntosh, Pres.

Gentlemen:

In reference to the sample pin to be used as a flashboard pin on your newly constructed spillway at Pulpit Rock Lake in Monson, we have checked this pin and find that in order to cause failure of the pin the head of water on the dam would be in excess of the 18" stipulated on the approved plans. The sample pin submitted did not fail until approximately 140 lbs. pressure was applied to the end of the pin while holding the base of the pin firmly. This pressure for failure indicates that in order to obtain an equivalent pressure on the pin, with 3 ft. spacing of pins on the dam, it would be necessary to have water higher than 6" over the top of the flashboards.

In order to be certain that the pins will fail with no more than 6" of water over the top of the flashboards, it would be well to cut a deeper notch or to make a hacksaw blade cut into the notch in order to result in earlier failure of the pins. This recommendation is made upon the assumption that all pins to be used on the spillway will be reasonably close in dimension and in notch to the pin submitted for test.

The pins are supposed to be arranged for progressive failure. Consequently, some of the pins should fail prior to 6" of water going over the flashboards.

Be sure in setting the flashboard pins that the notch is facing the pond side and not the downstream side. The cutting of the pins with a hacksaw to weaken the pins further, could be done with the pins in place on the dam and cuts could be made with the water level at about the top of the flashboards. In this way, the cuts should be judged by being sure that some of them are such that the pins are about ready to fail with water level with the top of the flashboards. Thus, progressive failure of the boards can start with a small topping of the board at those few pins cut fairly deep with the hacksaw. All other pins should be cut but not quite as deeply.

Very truly yours

George H. McDonnell
County Hydraulic Engineer

GHM/cmb

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

CD Monson
May 13, 1957

The Hon. the Board of County Commissioners
37 Elm Street
Springfield, Mass.


Gentlemen:

Enclosed for your information and file purposes, please find a copy of a communication sent to Pulpit Rock Farm, Inc., regarding flashboard pins to be used at Pulpit Rock Lake in Monson.

The contents of this letter are self explanatory.

Very truly yours

Tighe & Bond, Inc.


George H. McDonnell
County Hydraulic Engineer

Enc.
GHM/cmb

WATER SUPPLY

SEWERAGE

SEWAGE DISPOSAL

STRUCTURAL ENGINEERING

ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
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DAMS & POWER INSTALLATIONS

HIGHWAYS & BRIDGES

HOUSING DEVELOPMENT

WASTE DISPOSAL

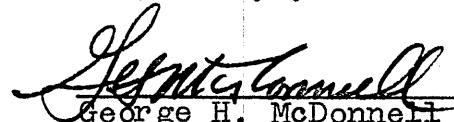
CD Monson
June 20, 1957

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Massachusetts

Gentlemen:

Mr. MacIntosh, president of Pulpit Rock Farms, Inc., asked me to inspect his dams and to submit to him recommendations regarding any maintenance and repairs required to the structures. I made this inspection and have written to him. I enclose herewith a copy of my letter for your information and file purposes.

Very truly yours


George H. McDonnell
County Hydraulic Engineer

Enc.
GHM/cmb

CD Monson
June 20, 1957

Pulpit Rock Farm, Inc.,
85 Oakland Street
Springfield, Massachusetts

Gentlemen:

I have examined your dams at Pulpit Lake and report the following conditions that should be taken care of in the very near future. This inspection of your dams has been made following a telephone call from Mr. H. E. MacIntosh requesting certain information regarding the structures.

An examination of the newly constructed dam on the easterly or right abutment indicates that some fill should be placed against the abutment wall on the pond side. The ponded water and wave action have caused some of this fine material to adjust itself to a flatter slope, and consequently the top of the fill has moved shoreward. To the east of the abutment and at a higher elevation there is ample fill. A man working with a shovel and wheelbarrow for approximately an hour will be able to move sufficient material from this high elevation to the pond at the abutment wall and fill in under water to replace the material that has moved. In replacing this material, you should instruct the person doing the work to use the more stony material on the east bank. The material can be dumped directly into the water and the stone contents of the material will assist in stabilizing the surface and prevent too much further movement as a result of wave action.

The condition existing at this right abutment is a natural condition that occurs and can only be prevented by placing material during construction at a very flat grade. Even then, wave action will cause a re-adjustment of the material. Riprapping or paving of the entire slope is one solution to the problem. However, such a solution is expensive and it is far more economical to place the fill as you did during construction. Maintenance necessary as a result of water and wave action during the first year or two of operation is an economical and practical procedure.

An inspection of the entire structure indicates that it is in satisfactory condition. Be sure that the flashboards are properly maintained and that only pins correctly notched are used to support the flashboards.

Pulpit Rock Farm, Inc.,
Springfield, Mass.

-2-

CD Monson
June 20, 1957

An examination of the westerly dam indicates that the spillway is in satisfactory condition. The embankment to the west of the spillway should be cleared of all brush and tree growth. If you desire to keep a few trees on the dam embankment, these trees should be trimmed in such a manner that the embankment can be examined from time to time by the undersigned. It is difficult to examine an embankment and to observe any imminent point of failure or settlement when the embankment is overgrown with brush and small trees. The brush removal on this dam embankment should take place as soon as possible.

At the westerly end of the embankment, a road has been cut into the earth and it would appear that the elevation of this cut is below the top of the embankment. Because of the growth on the embankment, it was not readily possible to determine if this condition results in a dangerously low notch thru the embankment. In any event, it would seem advisable to return the grade of the embankment to its original grade with properly compacted earth fill that would then be loamed and seeded.

The dike and embankment of the trout pond should also be cleaned and cleared of brush and scrub growth so that this structure can be properly examined. Flashboard facilities on the spillways should be constructed in such a manner that they will fail prior to the overtopping of the embankment at this structure.

After repairs have been made as outlined hereinabove, the undersigned will again inspect your structures.

Very truly yours

George H. McDonnell
County Hydraulic Engineer

GHM/cmb

Jan. 15, 1958

Pulpit Rock Farm, Inc.
85 Oakland Street
Springfield, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that your new dam located at Pulpit Rock Lake was recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Conditions at this structure are satisfactory. It was noted that the drain gate is slightly opened and some water is flowing from it. Flashboards were still in place on this dam when last inspected on Dec. 31, 1957. The flashboards should be removed until after the spring runoff."

Though flashboards, when properly designed and installed will fail and release flood flows, flashboards should not be maintained on a dam throughout late fall, winter and spring months unless their presence is absolutely necessary to the operation of a pond or reservoir. Also, by removing the flashboards you will be preventing the loss of these boards and bending of the pins during heavy spring runoff conditions.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

HAMPDEN COUNTY COMMISSIONERS

Oct. 22, 1958

Pulpit Rock Farm, Inc.
35 Oakland Street
Springfield, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the two dams impounding water at Pulpit Rock Lake and the small dam downstream of the westerly outlet have been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"New Concrete Dam Flashboards are still in place on the dam and should be removed. Each and every fall, flashboards must be taken from the dam and stored. They can be replaced in the spring after the spring runoff. Water level of Pulpit Rock Pond has been lowered by removing some of the stop planks from one of the spillway notches. This is a good practice and together with the removal of flashboards, an added safety factor will be available for protecting the dam. The flashboards are designed to be washed out in time of flood. However, it is not practical to leave them in place to be washed out and lost. It is more practical and economical to remove the flashboards and the pins for use in the succeeding summer season.

The upper portion of the frame of the control gate is split. This should be repaired now while the pond is drawn down. Fill is still needed at the right abutment. The need for this fill has been pointed out in the past. Both upstream and downstream of the concrete abutment wall are in need of additional earth. Approximately two cu. yds. of fill should be placed downstream of the wall and 12 cu. yds. to 15 cu. yds. or more placed upstream of the wall on the pond side. This fill can be readily and economically obtained from the hill just a few feet to the east of the abutment. Laborers working with wheel barrows can quickly and economically move the fill. A small front end loader could also be used for this purpose.

West Dam Flashboards are still in place on this dam and should be removed.

A large pine tree to the right of the spillway chute is in danger of falling into the spillway since most of the roots on the west side of the tree have been exposed by flood water. Should a wind storm blow the tree over, it could fall into the spillway and cause a partial blockage of this chute.

All tree growth and brush on the earth embankment of the dam must be cut down. A proper inspection of this embankment cannot be made nor can the need for proper maintenance be recognized with the heavy tree and brush growth. If the owner desires trees on this embankment, a few select trees could be left but they should not be allowed to grow very large.

Small Dam Flashboards on this dam should be removed for the winter. All brush and trees growing from the earth embankment sections of this dam should be cut down. "

This Board concurs in the recommendations of the County Hydraulic Engineer. It is to your advantage to remove flashboards each fall. Failure to remove them could result in the boards being washed away in the spring and you would then be faced with the cost of replacing bent pins and buying new flashboards. The removal of the flashboards improves the dam's safety factor.

The tree and brush growth on the westerly dam embankment should be removed immediately. Will you kindly notify this office when you will carry out the recommendations contained hereinabove.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Sept. 16, 1959

Pulpit Rock Farms, Inc.
85 Oakland Street
Springfield, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the two dams impounding water at Pulpit Rock Lake and the small dam downstream of the westerly outlet have been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"New Concrete Dam The grouted riprap at the downstream left of the dam has been cracked in the lower area. The cracking seems to be a result of some settlement and possibly slippage. This cracking is not serious now but will be watched for further movement in the future. The toe of the grouted riprap is being washed underneath by the water overflowing the main dam. This condition is not serious as yet but may require attention in another year or two.

At the right abutment, surface wash has removed some of the earth behind the concrete wing wall. This washed out earth should either be replaced and then loamed and seeded or the small gulley formed by the washout should be filled with boulders and rock.

Flashboards were found in place on the spillway and these flashboards should be removed very shortly and remain off of the dam until after the spring heavy runoff.

West Dam The spillway of this structure was found to be in satisfactory condition. One low flashboard was in place on the dam. The earth embankment was not covered with as thick a brush growth as noted in previous years. However, there are too many trees on the embankment and brush should be cut from time to time during the year.

Small Dam Flashboards in the main spillway were found at a much higher elevation than those in the smaller spillway. This condition does not provide an improved water level in the pond but simply reduces the safety factor at the dam. The flashboard level at the large spillway should be lowered to that of the boards in the small spillway. Following the summertime and early fall use of this pond, the flashboards should be removed from both spillways until after the spring runoff.

Brush and trees growing in and on the earth and stone embankment forming the major part of this dam should all be cut down and removed. "

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson

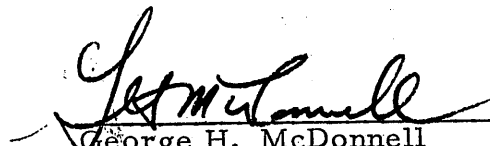
October 20, 1959

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

Enclosed herewith please find a copy of a communication sent to the Third National Bank in connection with the new Pulpit Rock Dam in Monson. The Bank is apparently handling the estate and is anxious to do necessary repair work as soon as possible. I have reviewed the repair work in the field with Mr. McDonald of the Bank and enclose herewith a copy of my communication that sums up the work as discussed in the field.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mb

Enc.

CD Monson
Oct. 20, 1959

Third National Bank & Trust Co.,
P. O. Box T
Springfield, Mass.

Att: Mr. S. T. McDonald

Gentlemen:

This will confirm my conversation with you in Monson, at the site of Pulpit Rock Dam, on Wednesday, Oct. 14, 1959 between 9 AM and 10 AM.

The dam in question is the new overflow structure built following the flood of August 1955. Immediately downstream from the toe of this new concrete masonry structure the overflowing water has washed into the bed of the stream and has caused the formation of a fairly sizable hole just at the toe of the dam.

It was recommended by the undersigned that the proposed plan of your contractor to install a concrete apron approximately 4" in thickness be altered. In order that the apron be sufficiently strong to withstand falling debris and ice passing over the spillway, it was recommended that the apron area be excavated for a distance of 12 ft. downstream of the toe and for the full width of the overflow between the riprapped banks and the apron be constructed of poured in place concrete at least 12" thick and better, 18" thick. No reinforcing steel would be required. The top grade of the heavy apron would be set about 6" below the level of the top of the overflow toe. This would result in the apron being just below water surface in the pool as it existed just downstream of the dam on the day of our inspection.

Your contractor has suggested cleaning and shaping the brook course downstream of the dam. Such a procedure would be satisfactory provided excavation in the brook course is held to a minimum. If the brook course is deepened downstream of the dam, it is natural for the overflowing water,

as it leaves any new apron construction, to eat into the brook course and cause a natural regrading of the brook bottom. Any excavation of the brook course to a major depth for its entire length would result in a considerable excavation at the toe of the dam and would thus necessitate the construction of a deep cut-off and toe wall.

On the left bank just downstream of the newly constructed spillway, the grouted riprap has been slightly undermined. Also, at the far downstream end of this grouted riprap bank, a crack has appeared in the riprap paving.

It has been suggested that concrete be placed at the toe of this grouted riprap slope between the riprap itself and an existing curb wall now in the bed of the brook. This would seem to be a desirable addition. Concrete could be poured at the toe of the grouted riprap surface and the concrete worked under the washed out edge with spades and rods. I do not think it will be necessary to break the end of the grouted riprap slope in order to get the concrete to flow under and into the void. A proper mix of concrete well spaded will flow into this shallow void.

In connection with the handling of water during the proposed repairs, it might be possible to draw down the pond with the drawoff gate and to then do the work after closing the drawoff gate and allowing the pond to store water. If the pond will not store water for a sufficiently long time to allow for construction at the toe of the dam in the dry, water could be taken over the top of one of the stop log sections and diverted around the active construction area with a sand-bag wall. It would appear as if handling of water in this manner will be much more economical than attempting to handle overflowing water with a bypass chute.

It is recommended that the work as discussed in the field and as outlined herein be accomplished before freezing weather, if at all possible. The undersigned would be pleased to inspect the work as it progresses and to advise your Contractor on the work if you will notify us when the work will proceed.

Very truly yours

GHM/cmb

George H. McDonnell
County Hydraulic Engineer

CD Monson
Dec. 18, 1959

Third National Bank and Trust Co.,
Springfield 2, Mass.

Att: Sager T. McDonald
Trust Officer

Gentlemen:

Reference is made to the work being done at the Pulpit Rock dam in Monson. While making routine inspections in Monson and, particular inspections at certain dams, I was in the area of Pulpit Rock dam on Thursday, Dec. 17, 1959. I inspected the dam and found that at the new structure the brook, downstream of the dam, had been graded and shaped. This has been well done. A concrete apron has been constructed at the toe of the overflow section of the dam structure. From all outward appearances, this would seem to be a good addition to the dam.

I note that work has also been done and is being carried on at the left embankment downstream of the new dam and where the old spillway chute has been blended with the new construction and the bed of the brook. I note work has been done at the toe of this riprapped area and that exploratory excavations have been made into the riprap at a location near the upper portion of the slope. An examination thru the exploratory excavations indicates an undermining of this riprap of some magnitude. No personnel was at work at the site on Dec. 17. I was at the dam at about 3:15 PM.

It is possible that the exploratory excavations have been made for the purpose of filling in under the riprap with concrete. It is also possible that the contractor or your company is trying to determine the cause of the undermining. I am particularly interested in learning why the cavity has been formed under the riprap. Apparently, there is some motion of water that has probably caused this action.

I note that no flashboards are in place on the dam. As now existing, should the pond rise rapidly and overflow the dam, there might be a possibility of water washing into the exploration area

2.
CD Monson
Dec. 18, 1959

on the riprap. It would be well to divert any water from this general area until a solution to the problem can be found.

I will be glad to assist your company or your contractor in the work of trying to determine a reason for the undermining of the riprap and a solution to the proper method of preventing its reoccurrence.

I can be reached at my office at Holyoke JEfferson 3-3991. The best time to call would be in the morning at about 8 or, in the afternoon after 4 PM. During the day I am usually out around various areas in the County.

Very truly yours

GHM/cmb

George H. McDonnell
County Hydraulic Engineer

CD Monson
Dec. 30, 1959

The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Massachusetts

Gentlemen:

Enclosed please find a copy of a communication sent to the Third National Bank and Trust Company, of Springfield, as well as a communication sent to William Jurczyk, Inc., of Oak Street., Monson. The letter to the Third National Bank has to do with the Pulpit Rock Dam in Monson. The contents of the letter are self-explanatory. The letter to Jurczyk has to do with the construction schedule in connection with the dam to be built in Monson. The contents of the letter are self-explanatory.

Both copies are sent to you for information and file purposes.

Very truly yours,

George H. McDonnell
County Hydraulic Engineer

GHM/mb

Enc.

Oct. 5, 1960

Pulpit Rock Farms, Inc.,
c/o Sager T. McDonald, Trust Officer
Third National Bank & Trust Company
Main Street
Springfield 2, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that the two dams impounding water at Pulpit Rock Lake and the small dam downstream of the westerly outlet have been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"New Concrete Dam This dam was found to be in good condition at the time of the last inspection on Sept. 15, 1960. There was little or no evidence of damage resulting from the heavy runoff caused by the rains of the hurricane on Monday, Sept. 12, 1960. Flashboards were found to be still in place on about two-thirds of the crest of the dam. All flashboards should now be removed and kept off of the dam until after the Spring flood flows. The drawoff gate in the dam was found open and the pond was nearly empty. Stone masonry repairs to the spillway were found to have withstood the flow of the flood in a satisfactory manner. It was noted that flood flows on Monday, Sept. 12, 1960 washed out the road below the dam, at the location of the brook culvert. This is not related to the dam. The culvert under the road is a separate structure and is much too small to convey the potential overflow from the spillway under the roadway.

West Dam Flashboards were found in the spillway of this dam and they should be removed now, until after the Spring runoff. In fact, flashboards should be taken off of the spillway crest each year immediately following the Summer use of the pond. The earth embankment at this dam should be cleared of all brush growth and trees growing thereon should be thinned out considerably and all low branches on large trees should be cut off. The dam cannot be properly

maintained nor can it be thoroughly inspected when a heavy growth of brush exists and many small trees are present. A minimum of trees on the embankment should be maintained for whatever aesthetic purposes are desirable. However, as the trees grow and become large, they must be cut down to prevent the potential loss of the embankment by the uprooting of large trees in wind storms.

Small Dam Flashboards were found to be in place on this dam, at the time of the last inspection. They should be removed and kept off of the two small dam spillways until after the Spring runoff. Flashboards on the larger of the two spillways appear to be at a higher elevation than the flashboards on the small spillway. The top elevation of the flashboards on both spillways should be the same. The spillway with the flashboards set up at the higher elevations should have the flashboards reduced to the elevation of the lower spillway. In the past it has been noted that on the large spillway, the flashboards have been carried at too great an elevation. All trees growing at, in, and near the masonry and earth sections of this dam should be cut down."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS



Third National Bank and Trust Company

OF SPRINGFIELD

SPRINGFIELD 2, MASSACHUSETTS

TRUST DEPARTMENT

October 6, 1960

Board of County Commissioners
37 Elm Street
Springfield 3, Massachusetts

Gentlemen:

We have forwarded your October 5, 1960, letter addressed to Pulpit Rock Farms, Inc., regarding the dams at Pulpit Rock Lake, to William W. Cox of Ames Road, Hampden, Massachusetts, who is now co-owner of the corporation with Earl G. Hewingson, Jr. of Monson.

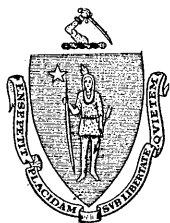
Please change the address of the corporation on your records.

Very truly yours,

Sager T. McDonald, Trust Officer

STM/TR

copy of this letter sent to
George H. McDonnell on Oct. 11, 1960.



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Thomas F. Sullivan

Ralph H. Walsh

December 16, 1964

Pulpit Rock Farms, Inc.
c/o Trust Department
Third National Bank & Trust Co.
Main Street
Springfield, Massachusetts

Att: Sager T. McDonald, Trust Officer

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that the lower of the three dams, that is the smallest dam that forms the small pond just below the main westerly dam at Pulpit Rock Lake in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is poorly maintained. It is only in fair condition. Both spillways were functioning on the day of the inspection. Flashboards in the right spillway are too high and should be removed or lowered to the elevation of the flashboards in the left spillway. The downstream face of the concrete masonry wall to the right of the left spillway is badly spalled and eaten away. This wall should be repaired and all brush as well as tree growth should be kept cut from the dam embankment and the vicinity of the masonry wall sections."

The recommendations contained in the report of the County Hydraulic Engineer should be followed. The dam embankment and the area in the vicinity of the masonry walls that form the dam should be properly main-

tained by keeping tree and brush growth cut down. The masonry construction as pointed out in the report should be repaired.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

William J. Finkle
Thomas F. Fullerton
Ralph P. Walsh

Third National Bank of
Hampden County

SPRINGFIELD 2, MASSACHUSETTS

TRUST DEPARTMENT

SAGER T. McDONALD
TRUST OFFICER

December 21, 1964

Hampden County Commissioners
Court House
37 Elm Street
Springfield, Massachusetts 01103

Gentlemen:

We return herewith your letter regarding one of the dams at Pulpit Rock Lake which is owned by Pulpit Rock Farms, Inc. This corporation was sold to William W. Cox in 1960 and of course any correspondence regarding its property should be sent to him. He lives on Ames Road, Hampden, Massachusetts, and the corporation itself has an office which can be reached by addressing a communication to it on Silver Street, Monson, Massachusetts.

Very truly yours,


Trust Officer

STM/tr

Enclosures

December 30, 1964

Mr. William W. Cox
Pulpit Rock Lake

Ames Road
Hampden, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that the lower of the three dams, that is the smallest dam that forms the small pond just below the main westerly dam at Pulpit Rock Lake in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam is poorly maintained. It is only in fair condition. Both spillways were functioning on the day of the inspection. Flashboards in the right spillway are too high and should be removed or lowered to the elevation of the flashboards in the left spillway. The downstream face of the concrete masonry wall to the right of the left spillway is badly spalled and eaten away. This wall should be repaired and all brush as well as tree growth should be kept cut from the dam embankment and the vicinity of the masonry wall section."

The recommendations contained in the report of the County Hydraulic Engineer should be followed. The dam embankment and the area in the vicinity of the masonry walls that form the dam should be properly maintained by keeping tree and brush growth cut down. The masonry construction as pointed out in the report should be repaired.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
December 16, 1965

The Hon. the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

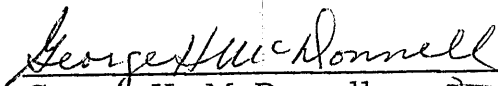
The undersigned received a telephone message at my office last week by a lady who did not leave her name that she was concerned over the fact that flashboards were still in place at Pulpit Rock Lake dams and wanted me to be aware of this condition.

Normally the flashboards on the dam constructed in 1955, are removed in the Fall and replaced in the Spring. On occasion, it has been necessary to advise the Owner to remove the flashboards.

In view of the telephone report, it would seem advisable to notify the present Owner of record to remove the flashboards if they have not already been removed during the past few days.

A suggested communication is enclosed herewith for your signature if you concur in its contents.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/mbf



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Thomas F. Sullivan
Ralph P. Walsh

December 22, 1965

Pulpit Rock Farms, Inc.
c/o Trust Department
Third National Bank & Trust Co.
Main Street
Springfield, Massachusetts

Att: Trust Officer

Gentlemen:

According to our records, the property and dams at Pulpit Rock Lake in Monson are under your control and jurisdiction. On the assumption that no change has been made since our last communication to you, we are hereby advising you that flashboards on the Pulpit Rock dams, particularly the new dam built following the 1955 flood, should be removed until after the Spring flood flows. The County Hydraulic Engineer has reported to our Board that a message was left at his office by a person who did not leave their name that the flashboards are still in place.

Will you kindly have maintenance personnel remove the boards and store them until after Spring flood flows.

If you have any question in connection with this matter, please contact our Board or the County Hydraulic Engineer at Holyoke 533-3991.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Ralph P. Walsh
Thomas F. Sullivan
William F. Stapleton

Third National Bank of Hampden County

SPRINGFIELD 2, MASSACHUSETTS

TRUST DEPARTMENT

SAGER T. McDONALD
TRUST OFFICER

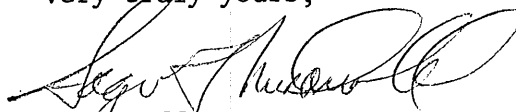
December 24, 1965

Hampden County Commissioners
52 State Street
Springfield, Massachusetts 01103

Gentlemen:

We return a letter addressed to Pulpit Rock Farms, Inc., in our care. This bank has had only a mortgagee interest in the real estate owned by that corporation since the sale of the corporation in 1961 to William W. Cox of Ames Road, Hampden, Massachusetts. We believe that we have advised you of this change of ownership previously, but in any event your records should now be changed to reflect his ownership.

Very truly yours,



Trust Officer

STM/tr

Enclosure

12.29.65 Copy sent to George H. McDonnell (F)

January 5, 1966

Mr. William W. Cox
Ames Road
Hampden, Massachusetts

Dear Sir:

According to present records, the property and dams in Pulpit Rock Lake in Monson are owned by you. We are hereby advising you that flashboards on the Pulpit Rock dams, particularly the new dam built following the 1955 flood, should be removed until after the Spring flood flows. The County Hydraulic Engineer has reported to our Board that a message was left at his office by a person who did not leave their name that the flashboards are still in place.

Will you kindly have maintenance personnel remove the boards and store them until after Spring flood flows.

If you have any question in connection with this matter, please contact our Board or the County Hydraulic Engineer at Holyoke 533-3991.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND

CONSULTING ENGINEERS

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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
September 5, 1968

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

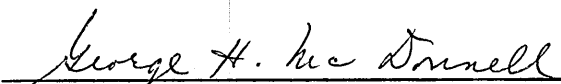
Gentlemen:

On Wednesday, September 4, 1968, the undersigned made an inspection of the West Dam at Pulpit Rock Pond and noted that the owner of this dam is in the process of complying with your letter of July 31, 1968.

Your Board concurred in the recommendation of the undersigned that the owner must clear all tree growth from the dam embankment. An inspection conducted on July 24th showed that the owner of the dam, Mr. William W. Cox, had taken no action to clear the embankment of tree growth.

On the inspection conducted September 4th, nearly all of the trees on the sloping portion of the embankment facing the pond have been cut and some trees have been cut from the top of the embankment. Though the deadline date for clearing the embankment of tree growth has passed, the owner is in the process of complying with your directive. Additional inspections will be made later this month when a routine inspection of all dams in Monson will be conducted. I will report to your Board at that time as to whether or not the owner is continuing with tree removal as directed.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph P. Walsh
Floyd M. Fradet

July 31, 1968

Mr. William W. Cox
Ames Road
Hampden, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams in Hampden County, you are hereby advised that the West Dam at Pulpit Rock Lake in Monson and apparently owned by you, has been recently inspected by our Engineer and the following conditions noted and reported to our Board. On July 24, 1968, the earth embankment at the West Dam remained unchanged insofar as tree growth is concerned. On April 10, 1968, we sent a communication to you setting forth the fact that all tree growth on this dam must be removed no later than July 30, 1968. The embankment forming the dam can be covered with a well maintained thick growth of turf.

Since less than a week remains from the time of the inspection by the County Hydraulic Engineer, to the date designated when the work must be accomplished, our Board is notifying you again of the requirement that the earth embankment at this dam be cleared of tree growth and be properly maintained.

If for any reason you are of the opinion that this work is not your responsibility or, if by chance ownership of the dam has changed, will you kindly notify our Board in writing. If the work of clearing the trees has not been completed as required on July 30th, and you are still the owner of the dam, please notify us immediately as to when you have scheduled the work of tree removal. Our Board would be agreeable to co-operate with you be setting a new deadline date for the work if for some reason you have been unable to meet the deadline date of July 30, 1968.

Chapter 253 of the General Laws of the Commonwealth of Massachusetts requires the County Commissioners to act where necessary to see that dams are maintained in a proper manner. Under the provisions of this Chapter, we will be required to take action unless our directive is complied with.

We call your attention to the closing paragraph of our letter of April 10, 1968. A short and reasonable extension can be granted. However, if the work is not accomplished by the original deadline date or an amended date agreed to within 10 days of the date of this communication, we will have no other recourse but to act under Chapter 253 of the General Laws of the Commonwealth.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

**TIGHE
& BOND**

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
March 17, 1969

Mr. William W. Cox
Ames Road
Hampden, Massachusetts

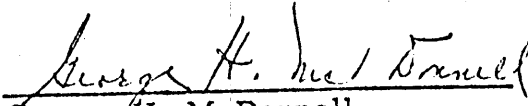
Dear Sir:

Reference is made to your dams at Pulpit Rock Lake in the Town of Monson, and the fact that there now exists a heavy snow cover throughout Western Massachusetts. The water content of this snow cover, coupled with a warm spring rain could result in extremely heavy runoff conditions. Consequently, the Commissioners of Hampden County have directed that I advise you to be sure that the spillway facilities at your dams are clear of any obstruction and that you take all precautions necessary to protect your dams as well as persons and property downstream.

You are directed to remove the flashboards from the crest of both dam spillways if they have not already been removed. It is also advisable that you lower the water level of the stored water through the use of the drawdown gate at the concrete dam. The lowering of the water must be done under controlled conditions so as not to discharge water at too fast a rate whereby flooding could be caused downstream.

If you have any question in connection with this matter, the undersigned can be reached at the above address and telephone number.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/amd

GEORGE H. McDONNELL
PHILIP W. SHERIDAN
EDWARD J. BAYON

TIGHE & BOND CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING
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BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

CD Monson
March 16, 1970

The Honorable the Board of County Commissioners
52 State Street
Springfield, Massachusetts

Gentlemen:

Re: Pulpit Rock Dams - Monson

The undersigned has made a re-inspection of the three dams at Pulpit Rock Lake in Monson to determine whether the owner of the dams followed recommendations and instructions sent to him by your Board in your letter of October 22, 1969.

New Concrete Dam

The owner did not remove the flashboards from the crest of the dam as directed in the first paragraph of your letter in the section relative to New Concrete Dam. Also, the footbridge leading to the drawdown gate and the gate operating mechanism have not been repaired and reconstructed as recommended. This work was to have been done last fall.

West Dam

The trees growing from the embankment of the West Dam have not been cut. The owner has until the spring of 1970 to complete the recommended work on the West Dam. Since none of this work has been done throughout the winter, it is apparent that the owner must be directed again relative to the removal of trees from the embankment if the surface of the embankment is to be properly altered and maintained by this spring.

Small Dam

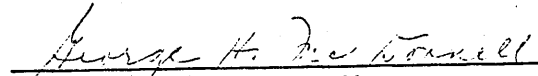
The small dam is in the same condition as reported to your Board last October. The owner should be reminded of the requirement that the small

**TIGHE
& BOND CONSULTING ENGINEERS**

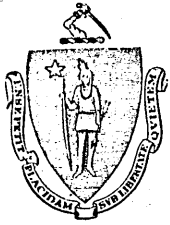
-2-

dam must be properly repaired and rebuilt or it should be breached no later than June 30th of this year.

Respectfully submitted,


George H. McDonnell
County Hydraulic Engineer

GHM/amd



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~Ralph H. Haskins~~
Floyd H. Fradet

Stephen A. Moynahan

March 18, 1970

R. C. A. Realty, Inc.
c/o Mr. Edward Christianson
East Longmeadow Road
Hampden, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dam of Hampden County, you are hereby advised that the two large dams forming Pulpit Rock Lake and the small dam downstream in Monson, have been recently inspected by our County Hydraulic Engineer and your attention is called to the following conditions noted at your three dams.

New Concrete Dam

The flashboards have never been removed from the crest of the dam nor has the breach leading to the drawdown gate operating mechanism been strengthened and repaired. This work was to have been done last fall. Your attention is called to the necessity of properly maintaining dams owned by you. They must be properly maintained or it will be necessary to enforce the provisions of the various sections of Chapter 253 of the General Laws regarding the maintenance and operation of dams.

You are reminded that flashboards on the New Concrete Dam are to be removed every fall and are to remain off of the crest of the dam until after the spring heavy runoff. Drawdown gate operating facilities must always be functional and accessible. There can be no compromise in regard to this matter.

West Dam

You are reminded again that all of the tree growth on the earth embankment of this dam must be removed and the surface of the embankment treated so as to develop a good, strong and healthy turf cover. This work must be accomplished by the spring of this year. Consequently, with the coming of warm weather and the melting of the snow cover, this work should be accomplished. It had been hoped that you would have taken advantage of the winter season to at least cut down the trees now growing from the embankment.

Small Dam

The small dam is still dilapidated and spillway capacity is reduced by debris, and in one instance a large wooden platform is blocking the spillway opening. This small dam must be properly repaired and the numerous trees growing along the embankment of the dam and from the stone masonry portion of the structure, must be cut down. The root structure should be killed and re-growth prevented so that further damage to the stone masonry will not occur.

If the small dam is of no value in your plans for development of the area, it would be wise to breach this structure and eliminate it as a water ponding facility. Whatever is done to the small dam must be done by June 30th of this year.

Any further information concerning these three dams which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Remington Dam fka Flynt Dam



1926 Monson

Dam built across Twelve Mile Brook. Also See: Flynt Dam.

| | |
|-----------|----------------------|
| City/Town | Monson |
| Dam | Remington Dam |
| Dam | Flynt Dam |
| Name | Remington, William B |
| Name | Wm B Remington Inc |
| Name | Flynt, Lyman C |
| Water | Twelve Mile Brook |

JAMES L. TIGHE

CONSULTING ENGINEER

CALEDONIAN BUILDING, 189 HIGH STREET

HOLYOKE, MASS.

TELEPHONE 790

MEMBER AM. INST. OF CONSULTING ENGINEERS, INC.

MEMBER
AM. SOC. C. E.
INST. C. E. GREAT BRITAIN
ENG. INST. OF CANADA

MEMBER
BOSTON SOC. C. E.
ENG. SOC. WEST. MASS.
AM. & N. E. W. W. ASSOC'S

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
ANALYSIS OF WATER

WATER POWER INVESTIGATIONS
AND DEVELOPMENT
DAMS AND POWER INSTALLATIONS
ESTIMATES AND APPRAISALS

December 30, 1930

The Hon. the County Commissioners,
Hampden County,
Court House, Springfield, Mass.

John G. Maxfield, Chairman:

Dear Sir:

While considerable work in the way of repairs has been done to stop the leakage through the earthen dam, built across Twelve Mile brook in Monson, there is still some leakage through the structure. This dam formerly belonged to Lyman C. Flint of Monson but now belongs, as far as could be ascertained, to William B. Remington, 115 Forest Park, Springfield, Mass.

If the dam is to be maintained it is recommended that further repairs be made thereon and all leakage stopped, likewise, that the trees growing in the dam, and adjacent thereto, be cut down inasmuch as the roots affect its imperviousness. It is also recommended that the pond be drawn down until the repairs are made.

Respectfully submitted,

James L. Tighe

December 30, 1930

Mr. William B. Remington,
115 Forest Park,
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Twelve Mile brook, so called, in the town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him:

"While considerable work in the way of repairs has been done to stop the leakage through the earthen dam, built across Twelve Mile brook in Monson, there is still some leakage through the structure. This dam formerly belonged to Lyman C. Flint of Monson but now belongs, as far as could be ascertained, to William B. Remington, 115 Forest Park, Springfield, Mass.

If the dam is to be maintained it is recommended that further repairs be made thereon and all leakage stopped, likewise, that the trees growing in the dam, and adjacent thereto, be cut down inasmuch as the roots affect its imperviousness. It is also recommended that the pond be drawn down until the repairs are made."

Now, therefore, in accordance with Section 46 of said Chapter 253 it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

Chairman

*This form written
by Mr. Tighe*

December 31, 1930

Mr. William B. Remington,
115 Forest Park,
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Twelve Mile brook, so called, in the town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him:

"While considerable work in the way of repairs has been done to stop the leakage through the earthen dam, built across Twelve Mile brook in Monson, there is still some leakage through the structure. This dam formerly belonged to Lyman C. Flint of Monson but now belongs, as far as could be ascertained, to William B. Remington, 115 Forest Park, Springfield, Mass.

If the dam is to be maintained it is recommended that further repairs be made thereon and all leakage stopped, likewise, that the trees growing in the dam, and adjacent thereto, be cut down inasmuch as the roots affect its imperviousness. It is also recommended that the pond be drawn down until the repairs are made."

Now therefore, in accordance with Section 46 of said Chapter 253 it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

Chairman

WM·B·REMINGTON *Inc.*
Advertising

1466 MAIN STREET & 21 BESSE PLACE
SPRINGFIELD MASS.

R

January 3, 1931.

Office of the County Commissioners,
County of Hampden,
Springfield, Mass.

Gentlemen:--

I acknowledge receipt of your letter of December 31st with reference to the dam on my place in Monson.

In the fall of 1929 I entered into an arrangement with William C. Moulton of Monson to undertake on a contract basis to stop the leak.

I presume that the last paragraph of your letter, which reads "within a reasonable time" will permit me to follow up Mr. Moulton and insist that he complete the work as he agreed to do.

Cordially yours,

Wm. B. Remington

WBR
BMN

*Copy of this letter sent
to Mr. James L. Tighe
on January 5, 1931*

May 10, 1933

Mr. William B. Remington,
21 Besse Place,
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Twelve Mile Brook, so called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"This dam is an earthen embankment faced on the downstream side with dry stone masonry. There are a number of trees growing in the embankment. It is recommended that these trees be cut down as they impair the stability of the structure by rocking in windy weather and by the extension of their roots through the dam, they may cause leakage. There is some leakage through the dam now which should be stopped. This probably could be done by depositing suitable earth material at the upstream toe of the dam."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Copy of
this letter
sent to Mr. Tighe
on July 1, 1933.

WM·B·REMINGTON Inc.
Advertising

1466 MAIN STREET & 21 BESSE PLACE
SPRINGFIELD MASS.

R

July 6, 1933.

Mr. Thomas J. Costello, Chairman
Office of the County Commissioners
Hampden County
Springfield, Mass.

Dear Sir:--

Under date of May 10th I received from you a notice of inspection by your engineer, with certain recommendations made by him to the effect that some trees be cut down because of the possibility of the trees causing leakage.

I have had the dam investigated by a number of practical men who have had experience with dams, and they have all expressed the opinion that the trees can do no damage whatever, and that they are not likely to cause any leakage.

There is a small leak to which your engineer refers. I spent several hundred dollars on the dam in 1929 and 1930 when the leak was much larger, and while this work did not eradicate the leak altogether, it cut it down to negligible proportions and it has not been increasing since.

I very much dislike to cut down any of the trees on this dam because their presence adds a great deal to the scenic beauty of the spot, and the dam itself is so wide and substantial that it is hard to see how these comparatively small trees can cause any trouble. The pond itself is comparatively shallow, and no great body of water is retained by the dam. Also, there is a deep gully below and no habitation anywhere beneath it that could cause trouble even if the dam gave way.

Under these circumstances I would like to have your permission to leave the dam as it is, at least until such a time as the leak becomes worse, which it has shown no signs of doing in the last three years.

Would appreciate some word from you on this.

Cordially yours,

Wm B Remington

COPY

JAMES L. TIGHE

CONSULTING ENGINEER

CALEDONIAN BUILDING, 189 HIGH STREET

HOLYOKE, MASS.

TELEPHONE 790

MEMBER AM. INST. OF CONSULTING ENGINEERS, INC.

MEMBER
AM. SOC. C. E.
INST. C. E. GREAT BRITAIN
ENG. INST. OF CANADA

MEMBER
BOSTON SOC. C. E.
ENG. SOC. WEST. MASS.
AM. & N. E. W. W. ASSOC'S

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
ANALYSIS OF WATER

WATER POWER INVESTIGATIONS
AND DEVELOPMENT
DAMS AND POWER INSTALLATIONS
ESTIMATES AND APPRAISALS

July 8, 1933

Mr. Wm. B. Remington Inc.
1466 Main Street,
Springfield, Mass.

Dear Sir:

Your letter to the County relative to your dam across twelve mile brook in Monson was turned over to me, the Engineer who inspected the dam, to answer.

In regard to the leakage through the structure, your attention was called to this because, as it is hardly necessary to state, a small leak is much easier and much less expensive to repair than a large one.

Leakage through a dam is not suggestive of stability and no matter how small and harmless a leak may appear it can become serious in an night.

I regret that I cannot agree with those practical men, who advised that the trees growing in the embankment and in the face of the structure, can do no damage to the dam. Am glad however that they did not go so far as to claim that these trees added to its stability.

At a later date I shall be glad to make an appointment to meet you at the dam and go over the whole matter with you.

Yours very truly,

James L. Tighe

November 3, 1937

Mr. William B. Remington
21 Beesse Place
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby notified that your dam on Twelve Mile Brook in Monson has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"There is a leak through the earth embankment of this dam at a point about 20 feet East of the East end of the spillway. Of late this leak seems to be increasing somewhat in volume and, if allowed to continue, may eventually cause failure of the structure. It is, therefore, recommended that the owner be notified to have this leakage stopped, or otherwise that a free water-way be made through the structure and the pondage discontinued."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

WILLIAM B. REMINGTON
21 BESSE PLACE
SPRINGFIELD, MASS.

November 4, 1937

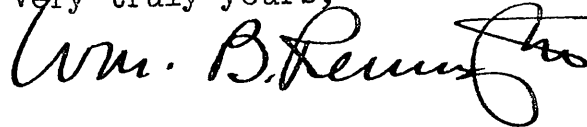
Mr. Thos. J. Costello, Chairman
County Commissioners
Commonwealth of Massachusetts
County of Hampden
Springfield, Mass.

Dear Sir:--

I acknowledge receipt of yours of
November 3, 1937 regarding my land on Twelve
Mile Brook in the town of Monson.

I will take steps to arrest the leakage
referred to at the earliest possible moment.

Very truly yours,



WBR:IH

Copy of this letter sent to
Mr. James L. Tighe, Engineer,
On November 10, 1937

December 17, 1947

Mrs. W. B. Remington
Administrator
Estate of W. B. Remington
41 Ridgewood Place
Springfield, Massachusetts

Dear Madam:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the dam belonging to the William B. Remington Estate and located on Twelve Mile Brook in the Town of Monson, has been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"In a recent inspection of the Remington dam in Monson, now owned by the Estate of William B. Remington, Springfield, Massachusetts, located on Twelve Mile Brook, it was found that the spillway has been decreased in area. The 1936 report on Hampden County Dams states, relative to the Remington Dam, as follows: 'The spillway is twenty-four feet in length with its crest two feet below the top of the Dam.' At present, the spillway is twenty-two and one-half feet in length with its crest one foot below the top of the dam.

The spillway as altered is inadequate to care for the run-off of heavy spring floods and should be cut back to its original depth at once."

In view of the highly dangerous condition of the dam as revealed by this report, you are hereby ordered to make such alterations or repairs as recommended in said

December 17, 1947

Mrs. W. B. Remington
Administrator,
Estate of W. B. Remington

- 2 -

report. If you refuse or neglect to do so, the County Commissioners will take such further action as is required by law.

The Commission requests that we be advised not later than January 14, 1948, as to what action is proposed to be taken by you in compliance herewith.

Yours very truly,

COUNTY COMMISSIONERS

Charles W. Bray

William Dwight

Thomas F. Sullivan

February 4, 1948

Philip E. Bond, the County's Hydraulic Engineer, came in this morning to report on two dams - the Peter F. Hogan Dam and the Remington Dam. Mr. Hogan has built a temporary spillway on the Abbe Brook which is all right for the present.

Mr. Bond has not heard from the owner's Engineer on the Remington Dam. Mr. Bray telephoned Attorney Donald Macaulay and told him that the County's Engineer was here now notifying the Comms that the Engineer for the Remington Dam had not appeared and that he (Mr. Bond) was worried and wished their Engineer would contact him immediately. Mr. Macaulay stated he had notified the owner that they must have their Engineer contact Mr. Bond. Mr. Bray requested Mr. Macaulay to contact the owner again and say that it is the Comms' order that the owner's Engineer see Mr. Bond at once. Mr. Macaulay telephoned the second time and stated the he had again contacted the owner and that she has agreed to have her Engineer meet with Mr. Bond soon.

Lloyd Moulton, of Monson is Mrs. Remington's Engineer.

JAMES L. TIGHE
PHILIP E. BOND

TELEPHONE
HOLYOKE 5525

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
WATER POWER
DAMS

February 17, 1948

The Hon. The Board of County Commissioners
Hampden County Court House
Springfield, Massachusetts

Charles W. Bray, Chairman

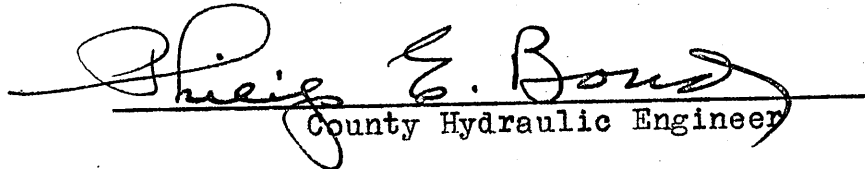
Dear Sir:

On February 16, 1948, I had an inspection made of the Remington Dam in Monson and the Mill Pond Dam in the Town of Brimfield. I find that the spillway of the Remington Dam has been lowered one foot in accordance with your communication of December 17, 1947.

The Mill Pond in Brimfield was also inspected and I find that one flashboard only has been removed. This dam is now owned by Charles P. Wheeler of Main Street in Brimfield. His attention was called to your letter of December 8, 1947, and he has promised to remove at once the additional two flashboards to comply with the decree which read as follows:

"It is ordered that the use of flashboards shall not be allowed on the spillway between the 1st of December and the 15th of April."

Very truly yours,


County Hydraulic Engineer

ATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL
C-D

November 9, 1955

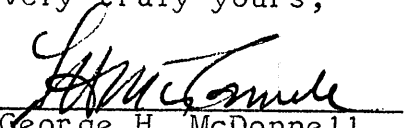
The Hon. the Board of County Commissioners
Hampden County Court House
Springfield, Mass.

Gentlemen:

On Tuesday, November 1st, the undersigned met with Mr. Phillips of Monson, relative to repairs to his dam and spillway located in Monson. The Phillips Dam is the old Remington Dam.

Mr. Phillips is having plans and specifications prepared for the repair of his dam and has requested advice regarding spillway capacity and design. The necessary information was passed on to Mr. Phillips at the time of the conference and it can be expected that in the very near future plans and specifications for the repair of the dam will be filed with your Board.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/emm

Reynolds Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------|
| City/Town | Monson |
| Dam | Reynolds Dam |
| Owner | Reynolds |

MONSON
D13046

REYNOLDS DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Ricketts & Shaw Dam



1926 Monson

Located on Chicopee Brook.

| | |
|-----------|---------------------|
| City/Town | Monson |
| Dam | Ricketts & Shaw Dam |
| Name | Ricketts |
| Name | Shaw |
| Water | Chicopee Brook |

March 3, 1926

Ricketts & Shaw,
Monson, Mass.

Gentlemen:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on Chicopee Brook so-called in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"The structure is not in very good condition as there is some leakage around the angle in the dam and towards the west end which requires repairing. The stone facing also should be pointed."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

Page 42 of report

Ricketts L Shaw,

Monson, Mass.

you are notified that your
dam, located on Chicopee Brook so called in the
Town of Monson, etc.

"The structure is not in very
good condition as there is some leakage
around the angle in the dam and towards
the west end which requires repairing. The
stone facing also should be pointed."

Now, therefore, etc.

Robbins Dam



1937 Monson

Located on Conant Brook. See also: County Highways (Monson) - "Dam for swimming pool on Thompson Brook - CE Robbins (Owner)" - ch10127. See also County Roads Plan #10 (1937) "Dam for swimming pool on Thompson Brook C E Robbins" record book 24 page 191.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Robbins Dam |
| Name | Robbins, Charles E |
| Water | Conant Brook |

July 21, 1937

Mr. Charles E. Robbins,
Mendon, Mass.

Dear Sir:

Your letter of July 18th has been received. In reply we wish to state that the statutes provide for the building of dams and we would advise you to file with the County Commissioners plans and specifications in accordance with Chapter 253 Section 44 of the General Laws and we will have our Engineer look them over.

Very truly yours,

COUNTY COMMISSIONERS

By _____ Chairman.

TJC/N

Sutcliffe Dam



1937 Monson

Dam on Ingalls Brook. Also see: Squire's Dam.

| | |
|-----------|----------------------|
| | |
| City/Town | Monson |
| Dam | Sutcliffe Dam |
| Name | Sutcliffe, Richard S |
| Water | Ingalls Brook |

November 3, 1937

Mr. Richard S. Sutcliffe
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby notified that your dam on Ingalls Brook in Monson has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"Notwithstanding that repairs have been made on this dam it still shows some leakage. Further repairs should be made and the leakage cut off if the pond is to be maintained; otherwise the pond should be drawn off and discontinued".

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

Rubwood Wheel Company Dam



1926 Monson

Located on tributary of Chicopee Brook. See also: County Highways (Monson) - "Rubwood Wheel Inc. - Repairs Dam on Chicopee Brook" - ch15031 & ch09036.

| | |
|-----------|---------------------------|
| City/Town | Monson |
| Dam | Rubwood Wheel Company Dam |
| Name | Rubwood Wheel Company |
| Name | Rubwood Wheel Inc |
| Water | Chicopee Brook |

Page 46 of report

Rutwood Wheel Company,
Monson, Mass.

you are notified that your
water supply dam, located on a tributary of Chicopee
Brook so called in the Town of Monson, etc.

"Notwithstanding that the
structure has been overhauled
last summer, there is some leakage
through it and it is recommended that
this leakage be repaired."

Now, therefore, etc.

March 3, 1926

Rubwood Wheel Company,
Monson, Mass.

Gentlemen:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your water supply dam, located on a tributary of Chicopee Brook, so-called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following recommendations made by him;

"Notwithstanding that the structure has been overhauled last summer, there is some leakage through it and it is recommended that this leakage be repaired."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable time.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

RUBWOOD WHEEL INC.

RUBBER WHEELS FOR AUTOMOBILES

MONSON, MASSACHUSETTS



August 17, 1926

County Commissioners
Springfield, Mass.

Gentlemen:

Referring to your request of March third to repair leak in dam on tributary of Chicopee Brook and to your later correspondence, I beg to state that repairs were made upon said dam within thirty days after receipt of your notice of March third.

Very truly yours,

RUBWOOD WHEEL INC.

HNA/BC

A handwritten signature in dark ink, appearing to read "Harry N. Amundson".

President

JE-3-3991

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN
December 30, 1955

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL
C-D Monson

The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

The undersigned has recently reinspected the dam owned by Dr. Paul G. Sanderson in Monson. The dam is located on Reimer Road and the road is actually a portion of the dam. The pond formed by the dam is known as Baldwin Pond and has a drainage area in the valley of 12-Mile Brook of slightly less than five square miles.

During the flood of August the water washed out the road to the left of the spillway and a large gap resulted in the dam. This gap has now been filled in order to restore the road. However, from an examination of the material in the field, it would seem that this fill by itself is not completely suitable for impounding water at Baldwin Pond. Structurally the thickness of the fill is probably satisfactory. However, it is doubtful if this fill is impervious enough to impound water during dry periods to maintain a pond level. It was noticed at the time of inspection that water was bubbling up under the ground at the downstream toe of the sandy type of fill. It is possible that a typical random sand fill was used to rebuild the road and that no special treatment was given to the fill insofar as a central impervious core is concerned or the tying and connecting of such a core to an impervious foundation.

The mass of the fill is such that it probably would be stable under normal pond level.

In view of the fact that the dam was washed out in the August flood, and since experience during this past year has shown that spillway capacities of dams should be enlarged, particularly where dams received major damage in August, it is thought advisable that the spillway on this structure should be increased in capacity, or an additional spillway should be provided so that large tropical type storm run-offs could be passed under and across Reimer Road without endangering the road and the dam and thus cause sudden loss of water stored in Baldwin Pond.

It would seem advisable to have the owner of this pond review the hydraulics having to do with the passing of storm flows through the dam and if the level of Baldwin Pond is to be maintained at the same elevation as in the past, consideration should be given to either increasing the size of the existing spillway or adding an additional

The Hon. the Board of County Commissioners
Springfield, Mass.

-2-

December 30, 1955

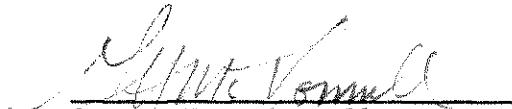
spillway to take extreme high flows. This additional spillway could be of the conduit type with a drop inlet such as a vertical shaft of concrete or masonry built out into the pond into which extremely high water could overflow and then pass on under the road.

In addition to providing extra spillway capacity, the Owner of the Dam should install an impervious core in that section of the dam refilled for the purpose of restoring Reimer Road. As pointed out in the second paragraph of this letter, the fill appears pervious and leakage occurs through this newly filled section. The owner of the dam could probably allow the new fill to remain but if pond level is to be maintained it would seem necessary to install a proper impervious core. This core could be steel sheeting properly interlocked and driven into the foundation of the dam to cut off seepage under the dam. The sheeting should extend upward to the top of the dam. This sheeting could be driven along the shoulder of Reimer Road on the upstream or pond side and the sheeting should extend from the existing spillway 90 to 100 feet to the West.

In order to safely allow the Owner of this dam to repond the water to the normal level, it would seem advisable to require an increase in spillway capacity and the installation of a proper core.

Very truly yours,

GHM/emm


George H. McDonnell
County Hydraulic Engineer

Baldwin Pond Dam aka Sanderson Dam



1955 Monson

Located on Reimer Road, which is actually a portion of the dam at Baldwin Pond, in the area of Twelve Mile Brook.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Baldwin Pond Dam |
| Dam | Sanderson Dam |
| Name | Sanderson, Paul G |
| Streets | Reimer Road |
| Water | Twelve Mile Brook |
| Water | Baldwin Pond |

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING

TIGHE & BOND, INC.
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN
January 3, 1956

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL
C-D Monson


The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

In connection with the case of Dr. Paul G. Sanderson and his dam at Baldwin Pond on Reimer Road in Monson, I am submitting herewith my letter report to you on this subject.

I have discussed this matter with Dr. Sanderson and have provided him with a copy of this letter report.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/emm
enc.

The Hon. the Board of County Commissioners
Springfield, Mass.

-2-

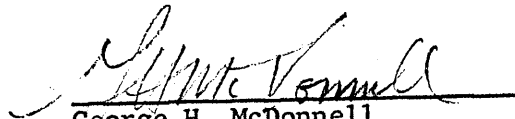
December 30, 1955

spillway to take extreme high flows. This additional spillway could be of the conduit type with a drop inlet such as a vertical shaft of concrete or masonry built out into the pond into which extremely high water could overflow and then pass on under the road.

In addition to providing extra spillway capacity, the Owner of the Dam should install an impervious core in that section of the dam refilled for the purpose of restoring Reimer Road. As pointed out in the second paragraph of this letter, the fill appears pervious and leakage occurs through this newly filled section. The owner of the dam could probably allow the new fill to remain but if pond level is to be maintained it would seem necessary to install a proper impervious core. This core could be steel sheeting properly interlocked and driven into the foundation of the dam to cut off seepage under the dam. The sheeting should extend upward to the top of the dam. This sheeting could be driven along the shoulder of Reimer Road on the upstream or pond side and the sheeting should extend from the existing spillway 90 to 100 feet to the West.

In order to safely allow the Owner of this dam to repond the water to the normal level, it would seem advisable to require an increase in spillway capacity and the installation of a proper core.

Very truly yours,



George H. McDonnell
County Hydraulic Engineer

GHM/emm

July 18, 1937

The County Commissioners,
Springfield
Mass.

Dear Sirs:

Would you
give me permission to build a
dam on the Coarut Brook
about eight feet tall for a
swimming pool? The place
is being used by the people of
the town and is not large enough
and the young fellows want to
help make the dam so more
people can use the brook.

Yours respectfully
Charles E. Robbins
Chenoweth
Mass

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS
GEORGE H. McDONNELL
PHILIP W. SHERIDAN
January 3, 1956

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL
C-D Monson

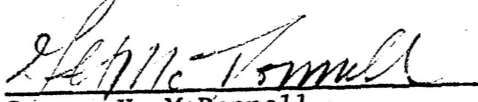
The Hon. the Board of County Commissioners
Hampden County Court House
Elm Street
Springfield, Mass.

Gentlemen:

In connection with the case of Dr. Paul G. Sanderson and his dam at Baldwin Pond on Reimer Road in Monson, I am submitting herewith my letter report to you on this subject.

I have discussed this matter with Dr. Sanderson and have provided him with a copy of this letter report.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/emm
enc.

Dec. 19, 1956

Dr. Paul G. Sanderson
205 Colony Road
Longmeadow, Mass.

Dear Sir:

In accordance with Chapter 253 of the General Laws of the Commonwealth of Massachusetts regarding the safety and general condition of dams in the County, your Dam at Baldwin Pond near Reimer Road in Monson has been recently inspected by our Engineer and his report on the condition of the dam is as follows:

"The spillway is a small stone masonry structure located at the right of the embankment fill. This structure is small and should be enlarged to properly handle anticipated flood flows."

The report of our Engineer points out that following the flood of August, 1955, a breach at the highway was repaired to re-open the road and that the fill used is a granular material that would probably wash out rapidly if flood water should again top the road. An alternative to the enlargement of the spillway would be the treatment of this fill to prevent a sudden or rapid failure should the fill be topped again.

If you desire any further information on this matter, please do not hesitate to call upon us.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GHM/r

Oct. 22, 1958

Dr. Paul G. Sanderson
205 Colony Road
Longmeadow, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that your lower dam located at Baldwin Pond off of Reimer Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The spillway capacity at this dam should be increased. This has been recommended previously. Stop logs now in the spillway should be removed until after the spring runoff. In fact, in order to obtain the greatest capacity from this spillway, the stop logs should be removed permanently until a new and larger spillway is constructed."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

copy of this letter sent to Dr. Sanderson on Dec. 12, 1958,
per instructions of Comm R.P. Walsh.

Sept. 16, 1959

Dr. Paul G. Sanderson
205 Colony Road
Longmeadow, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that your lower dam located at Baldwin Pond off of Reimer Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The spillway capacity at this dam should be increased. This has been recommended previously. Stop logs located in the spillway slot should be removed and kept out of the slot until such time as proper spillway capacity is provided. "

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Shepard Dam - Upper



1926 Monson

Formerly "Sanderson Dams". Also see: Silver Lake Dams, Upper & Lower.

| | |
|-----------|---------------------|
| City/Town | Monson |
| Dam | Shepard Dam - Upper |
| Dam | Sanderson Dam |
| Name | Sanderson |
| Name | Shepard, J E |
| Name | J E Shepard Company |

MONSON
D13052

SHEPARD DAM - UPPER

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Sprague Dam



1960 Monson

Small diverson dam located on East Brook at the end of Little Rest Road.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Sprague Dam |
| Name | Sprague, E Russell |
| Streets | Little Rest Road |
| Water | East Brook |

Aug. 24, 1960

E. Russell Sprague
89 Main Street
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition, and safety of the dams of Hampden County, you are hereby advised that the small diversion dam located on East Brook at your property at the end of Little Rest Road has been recently inspected by our Engineer.

At the present time, you have a small concrete and stone masonry diversion dam across the brook forming a very small pond to supply a pipeline feeding an artificial swimming pool located on the left bank of the brook. The dam as existing comes under County jurisdiction as per Chapter 253 of the General Laws of the Commonwealth, Sections 44 thru 50 inclusive. A copy of these Sections is enclosed herewith for your information.

Though the dam does not store one million gallons of water, nor is it 10 ft. in height above the bed of the stream, it is on a drainage area of over one square mile and consequently, comes under the provisions of Chapter 253.

Since the structure as existing is negligible in size from the viewpoint of doing damage to persons and property downstream and since you are the owner of land on both sides and downstream of the dam, it will not be necessary to file any plans or specifications showing the structure, at this time. However, any enlargement or major change to the dam, as now existing, should be made in accordance with the requirements of Sections 44 thru 50 of Chapter 253 of the General Laws.

If you have any question in connection with this matter, kindly call on either

this Board or on the County Hydraulic Engineer. We will be pleased to have him advise you as needed on engineering matters relating to your small dam.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

William F. Stapleton

Thomas F. Sullivan

Acting
Commissioner Francis M. O'Keefe

Springfield Sportsmen's Club Dam



1948 Monson

Dam located on property off of Wood Hill Road on Temple Brook.

| | |
|-----------|----------------------------------|
| City/Town | Monson |
| Dam | Springfield Sportsmen's Club Dam |
| Name | Springfield Sportsmen's Club Inc |
| Streets | Wood Hill Road |
| Water | Temple Brook |

Springfield Sportsmen's Club.
20. Monson Mass.

Mr. Charles W. Bray.

Dear Sir:

Your letter of Sept. 20, was given
to me by Paul Balise, I am the
Chairman of the fish committee.

I went out there to-day and
took care of the things you outlined
in your letter.

I believe you are a member
of the club, and perhaps familiar
with the type of fish screens we
have at the trout pond. They are
straight iron rods about an inch
apart. We have a caretaker at

of water would make any difference.

Please let me hear from you, and be assured that we intend to comply with any recommendations made by you.

Yours truly

W. R. Compton
311 Fountain St.

Appld.

Chairman, Fish Committee.

Copy of this letter mailed to
G. H. McDonnell, County Hydraulic Engineer,
on October 5, 1950.

the club that lives there with his wife all the year round. It has been his habit to make periodical trips up to the pond and keep those screens cleaned out. At the present time the screens

are completely removed from the dam. What I would like to know is, would it be alright to replace these screens, to prevent these trout that we have paid for from going over the dam? Our caretaker would keep the screens clear enough so that no amount

JAMES L. TIGHE
PHILIP E. BOND

TELEPHONE
HOLYOKE 5525

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
WATER POWER
DAMS

October 13, 1950

The Hon. The Board of County Commissioners
Hampden County Court House
Springfield, Massachusetts

Attention: Thomas F. Sullivan, Chairman

Gentlemen:

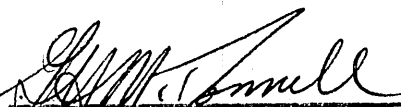
In accordance with your instructions I have investigated the request set forth in a letter from Mr. W. R. Compton of 311 Fountain Street, Springfield, Mass., pertaining to the fish screens on the spillway of the Springfield Sportsmen's Club dam in Monson.

In accordance with your letter to Mr. Compton, setting forth the results of our inspection of the dam, the Sportsmen's Club have removed the fish screens, cleaned the swale spillway, and investigated the leak at the base of the dam. Mr. Compton would like to replace the fish screens, in order to prevent loss of trout placed on the pond. The undersigned has talked with Mr. Compton and explained to him that the size of the present swale spillway is inadequate to care for maximum possible runoff, without the full flow of the regular spillway being available. It was pointed out that if the fish screens were left in place, and even if they were clean, the overflow area of the spillway would be too small for safety, and, consequently, the swale spillway would require enlargement.

It was agreed to allow the Sportsmen's Club to replace their fish screens on a permanent basis, if the swale spillway would be enlarged. They have agreed to do this work and the undersigned will inspect it within the next few days, and, if the increased size is sufficient to satisfactorily care for peak runoff, approval of the fish screens on a permanent basis will be given.

Very truly yours,

By


G. H. McDonnell

County Hydraulic Engineer

JAMES L. TIGHE
PHILIP E. BOND
TELEPHONE
HOLYOKE 5525

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
WATER POWER
DAMS

October 17, 1950

The Hon. The Board of County Commissioners
Hampden County Court House
Springfield, Massachusetts


Attention: Thomas F. Sullivan, Chairman

Gentlemen:

Enclosed, for your information and files,
is a copy of a letter sent to Mr. Compton in re-
gard to his request for permanent fish screens
at the Springfield Sportsmen's Club dam in Monson.

The enclosed letter is self-explanatory.

Very truly yours,


G. H. McDonnell
County Hydraulic Engineer

COPY

December 8, 1947

Springfield Sportsmen's Club, Inc.
Wood Hill Road
Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the dam on Temple Brook in Monson, owned by you, has been inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"In a recent inspection made of the Springfield Sportsmen's Club, Inc. on Temple Brook in Monson, it was found that the pond was drawn down and repairs were being made on the dam and spillway. Before the pond is filled, the emergency overflow or swale so-called, at the west end of the dam should be cleaned out and graded."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By Charles W. Bray
Chairman

William Dwight

Thomas F. Sullivan

BEMIS & CALL COMPANY
SPRINGFIELD . MASSACHUSETTS

January 21, 1948

Office of the County Commissioners
37 Elm St.
Springfield, Mass.

Gentlemen: Att. Mr. Charles N. Bray, Chairman

Referring to your letter of Dec. 8, 1947 addressed to the Springfield Sportsmen's Club, Inc., I have taken up the matter of an emergency overflow with Mr. Phillip Bond of Holyoke as you suggested.

With your approval, we will proceed to clean swale of brush and grade spillway on west side of dam to 6" deep below present level of dam to a width of 8 ft.

Approval of above is urgently required so that we may proceed immediately with this work.

If final inspection is necessary after completion of the work before flooding the pond, please let me know.

Hoping to see you at our next meeting.

Very truly yours,



Director of Fish
SPRINGFIELD SPORTSMEN'S CLUB, INC.

743 White St.

January 28, 1948

Philip E. Bond, Hydraulic Engineer,
189 High Street,
Holyoke, Mass.

Dear Mr. Bond:

Enclosed find copy of letter
dated January 21, 1948 from F. G. Kelley, Director
of Fish, Springfield Sportsmen's Club, Inc., which
is self-explanatory.

We trust that you will contact
Mr. Kelley as soon as possible and notify him as to
the procedure you wish him to follow.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman.

CWB/N
Encl.

January 28, 1948

F. G. Kelley, Director of Fish,
Springfield Sportsmen's Club, Inc.,
743 White Street,
Springfield 8, Mass.

Dear Mr. Kelley:

This will acknowledge receipt of
your letter dated January 21, 1948.

We are forwarding a copy of your
letter to Philip E. Bond, Hydraulic Engineer for
the County, with a request that he notify you im-
mediately as to the procedure to be followed.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman.

CWB/N

September 20, 1950

Mr. Balise, President
Springfield Sportmen's Club
C/o Balise Motor Sales, Inc.
603 Columbus Avenue
Springfield, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"There is a leak at the base of the dam east of the spillway. The swale spillway is choked with brush and must be cleaned out. Fish screens in place on the spillway and swale must be removed during the winter and should not be replaced until after the spring runoff."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

COPY

October 17, 1950

Mr. W. R. Compton
311 Fountain Street
Springfield, Mass.

Dear Sir:

In accordance with our discussion of a week or so ago, I have visited the Springfield Sportsmen's Club dam in Monson and examined the enlarged swale spillway. This spillway is too small, even without the fish screens being in place on the main spillway. Review of the data, pertaining to possible peak runoff, indicates that the swale spillway must have a width of at least five feet at its present enlarged depth, to adequately care for peak runoff.

In a letter of February 3, 1948, a swale spillway 12 feet wide and 6 inches deep was required, if fish screens were to be placed on the permanent spillway. This swale spillway was approved so that fish screens could be placed upon the main or permanent spillway. The fish screens were not to be left in place twelve months of the year. Computations made at that time indicate that this size of swale would require removal of the fish screens during the period from mid-winter through the spring runoff.

If you desire to keep the fish screens in place permanently, it will be necessary to have a swale spillway at least 13 feet wide and 12 inches deep. Any swale spillway smaller than this would require that the fish screens be removed for the spring runoff.

If you wish to discuss this with me, kindly call me at this office and, if necessary, I will be glad to go to Monson with you to stake out the proper size of spillway.

Very truly yours,

By

G. H. McDonnell
County Hydraulic Engineer

November 14, 1951

Springfield Sportsmen's Club
c/o Mr. Balise, President
Balise Motor Sales, Inc.
603 Columbus Avenue
Springfield, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Fish screens were found in place on the main spillway and the swale spillway. The swale spillway is not large enough to allow for year-round use of fish screens. Fish screens should either be redesigned and reconstructed for year-round use, the swale spillway should be enlarged, or the screens should be removed during each Winter and Spring season. The leak at the base of the dam has not been plugged, however, this leak does not seem to be of serious nature."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____ Chairman

*Spfld. Sportsmen's Club
Monson*

December 3, 1952

Springfield Sportsmens' Club
c/o H. Balise
Balise Motor Sales, Inc.
603 Columbus Avenue
Springfield, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Fish screens are still in place and the swale spillway still is not large enough. The swale spillway should be properly constructed or the fish screens removed from the main spillway. The main spillway is partly blocked by pieces of wood and a low foot bridge which should be raised."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman

Spfld. Sportsmens' Club Dam Monson

December 23, 1953

Springfield Sportsmen's Club, Inc.
Woodhill Road
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located in Monson has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"The foot bridge over the main spillway is too low in reference to the water level of the pond. This foot bridge should be raised to provide more clearance between the bottom of the bridge and the surface of the water. This would be an easy and simple alteration, and would prevent possible serious damage to the spillway and dam. The swale spillway located on natural ground at the right end of the dam should be enlarged by increasing its width."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____
Chairman

November 10, 1954

Springfield Sportsmen's Club
Woodhill Road
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located off of Woodhill Road on your property at Monson, has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"The foot bridge over the main spillway of the dam should be raised approximately one foot above water level. All debris should be cleaned from the main spillway. The swale spillway constructed at the right end of the dam should be widened."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,
COUNTY COMMISSIONERS

By _____ Chairman

Sept. 16, 1959

Springfield Sportsmen's Club
Wood Hill Road
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et. seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on your property off of Wood Hill Road has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The main spillway at this dam should be cleared of weeds and vegetation. The fish screen is still in place and should be removed in the fall and kept off of the spillway until after the spring runoff.

The swale spillway at the right of the dam should be enlarged considerably to increase its capacity.

There is a small leak thru the dam at the left of the spillway but this leak has existed for years and does not endanger the dam."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Dec. 19, 1956

Springfield Sportsmen's Club
c/o Balise Motor Sales
603 Columbus Ave.
Springfield, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253 of the General Laws of the Commonwealth of Massachusetts relative to the inspection, safety and general condition of dams in the County, you are hereby notified that the dam owned by your Sportsmen's Club in Monson was recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him:

"The swale spillway at the right end of the dam should be enlarged and cleared."

Your attention is called also to the fact that the bridge over the main spillway constructed for the purpose of carrying foot traffic should have sufficient clearance between the crest of the spillway and the bottom of the bridge to allow for free passage of water and to prevent the collection of debris against the bridge.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

GHM/f

Oct. 5, 1960

Springfield Sportsmen's Club
Wood Hill Road
Monson, Mass.

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located on your property off of Wood Hill Road has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"This dam has been cleared fairly well of all weeds and vegetation. The spillway itself has been cleaned and is in relatively good condition. The screen was still in place in the spillway and should be removed in the Fall and kept off until the following Spring runoff or, the screen should be rebuilt so that it can automatically swing outward if it becomes plugged with debris and leaves. The swale spillway at the right of the dam should be enlarged considerably to increase its capacity."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS



Commonwealth of Massachusetts
County of Hampden
Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

~~XXXXXXXXXX~~

Floyd W. Fradet

Stephen A. Moynahan

October 22, 1969

Springfield Sportsmens' Club
Woodhill Road
Monson, Massachusetts

Gentlemen:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located on your property off of Woodhill Road has been recently inspected by our County Hydraulic Engineer, and your attention is called to the following conditions noted and recommendations made by him.

"The fish screen on the spillway of this dam was quite dirty and plugged with debris at the time of the recent inspection. It should be cleaned frequently by maintenance personnel at the Sportsmens' Club property. The three railroad ties lying in the spillway, just under the footbridge, should be removed. In case of flood flow conditions, they may become caught in the spillway and as a result, act to block the flow of water in the spillway and reduce its capacity. These railroad ties apparently serve no purpose in their present position.

All tree growth occurring from the face of the downstream stone masonry wall and all regrowth in the form of brush along the top of the wall should be cut down and regrowth discouraged.

On the day of inspection, water level in storage was at the spillway crest. Improvements made to the spillway sidewalls are satisfactory.

The swale spillway at the right end of the embankment was noted to be o.k. It should be kept clear of obstructions and brush growth.

The toe area of the dam was in satisfactory condition. There is no erosion of any concern at the spillway or at the toe of the stone wall.

Some minor seepage was noted thru the stone wall near its base but the seepage was minor in nature.

In the opinion of the undersigned, the dam is safe. However, it must be maintained if it is to remain in a safe condition, and the recommended work as outlined hereinbefore, should be done by early next summer at the very latest. "

The maintenance as recommended by the County Hydraulic Engineer should be done. Cleaning of the fish screen and removal of the railroad ties must be accomplished upon receipt of this communication. Tree growth should be cut down during the fall or winter months.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Squire's Dam



1933 Monson

Located at outlet of Squire's Pond. Also see: Sutcliffe Dam.

| | |
|-----------|----------------------|
| City/Town | Monson |
| Dam | Squire's Dam |
| Name | Squire, Edgar |
| Name | Sutcliffe, Richard S |
| Water | Squire's Pond |

Monson Mass. July 12th 1933

Office of the County Commissioners
Springfield Mass.

Thos. J. Costello Chairman

Dear Sir:-

This is to inform you that
the repairs to the dam at Squiers
pond in Monson concerning
which you wrote ~~me~~ ^{me} ~~you~~ on May 10th
has been completed.

The property has been sold to
Richard S. Sutcliffe who is
the present owner

Yours truly
Edgar Squier

Copy of this letter sent to
Mr. Tighe on July 20, 1933.

May 10, 1933

Mr. Edgar Squire,
Moulton Hill,
Monson, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your north dam, located at the outlet of Squire's Pond, so called, in the Town of Monson, has been inspected by our engineer and your attention is called to the following condition noted and recommendation made by him;

"Some of the dry stonework on the downstream side of the dam near the west end has been dislodged and has fallen out. This stonework should be re-set and made secure."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Monson, Massachusetts
May 16, 1933

County Commissioners
Hampden County
Springfield, Mass.

Gentlemen:

Your letter in regard to the defective dam at
Squier's Pond in Monson, received.

I will attend to the matter soon, and report
to you when the work is completed.

Yours truly,

Edgar Squier

Sullivan Dam



1929 Monson

Dam located northerly of Mill Street near cemetery across Chicopee Brook.

| | |
|-----------|-----------------------|
| City/Town | Monson |
| Dam | Sullivan Brothers Dam |
| Dam | Sullivan Dam |
| Name | Sullivan, Cornelius |
| Name | Pease, William |
| Name | Sullivan, William |
| Streets | Mill Street |
| Streets | Stafford Road |
| Water | Chicopee Brook |

MONSON DAM IS SWEEPED OUT, BUT DAMAGE IS SMALL

Sullivan Reservoir Near Mill Street Drained When Wall Goes—Barn in Path of Water Undermined

Monson, June 1.—The stone and earth dam of the reservoir on the property of William and Cornelius Sullivan on Mill street went out at 10 this morning, causing damage to the barn owned by the Sullivans, but little other damage. Tons of dirt and stone were swept against the barn by the water, which undermined the structure and twisted it out of plumb.

The water and debris then struck the Sullivan cider mill below the barn and close to Mill street, but did not seriously damage it. Continuing, the deluge swept along Mill street and across Main street to the meadow and into Chicopee brook. There was only slight damage to the street.

The reservoir which is used to supply power for the Sullivan cider mill is situated nearly on a level with Hill side cemetery many feet above Mill street. It is supplied by a pond west of the Mill-street entrance to the cemetery.

The wall holding the reservoir was 40 feet long and 12 feet deep. Someone is believed to have opened the gate in the pond which supplies the reservoir and the force of the water gouged a hole in the reservoir wall 20 feet wide. A part of the embankment was then carried away.

The original dam was smaller than this one and was built in 1845 by William Moore for running the machinery of his box shop. After this shop was burned a number of years later, the property was purchased by the Sullivan brothers. In 1893 they rebuilt the dam, using a carload of stone as filler. The entire dam will have to be rebuilt and repiped at a probable cost of \$2000.

Ad. Union Sunday June 2nd 1902

JAMES L. TIGHE

MEMBER
AM. SOC. C. E.
INST. C. E. GREAT BRITAIN
ENG. INST. OF CANADA

CONSULTING ENGINEER
CALEDONIAN BUILDING, 189 HIGH STREET
HOLYOKE, MASS.
TELEPHONE 790

MEMBER
BOSTON SOC. C. E.
ENG. SOC. WEST, MASS.
AM. & N. E. W. W. ASSOC'S

MEMBER AM. INST. OF CONSULTING ENGINEERS, INC.

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
ANALYSIS OF WATER

WATER POWER INVESTIGATIONS
AND DEVELOPMENT
DAMS AND POWER INSTALLATIONS
ESTIMATES AND APPRAISALS

June 3rd, 1929.

The Hon. The Board of County Commissioners,

Hampden County, Springfield, Mass.

John G. Maxfield, Chairman.

Dear Sir:

In relation to the failure of a dam in the Town of Monson as reported in the Springfield Union Republican on Sunday last, after reading the item I visited Monson and found that the dam that failed was not the Sullivan dam proper built across the stream at Mill Street, but a small structure about 500 feet therefrom built on the edge of Hillside Cemetery where it formed a small basin or reservoir partly in excavation, averaging about 35 feet in length, 25 feet in width and 5 feet in depth, with a capacity of about 35,000 gallons.

This reservoir was fed by a pipe laid thereto from the dam proper and was used for furnishing water for washing purposes in the cider mill.

The damage done by the failure was slight and consisted in general of wash and accumulation of dirt and debris in and around the old mill.

Respectfully Submitted,

James L. Tighe

November 10, 1954

7

Mr. William Pease
Mill Street
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located northerly of Mill Street near the cemetery, has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

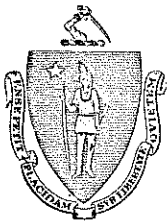
"This dam was formerly the Sullivan Bros. Dam and is now owned by William Pease of Mill Street, Monson. No pond is formed by the dam since the pond bottom has been nearly completely silted up. At the present time water goes around the dam by way of an intake structure and a pipeline that discharges at some point below the dam. The pipeline is broken a short distance below the dam and water now emerges from a wash-out in the left bank of the stream just below the dam, causing some erosion. Though the safety of the structure is not endangered by the broken pipe, it might be advisable to notify the owner of the existing condition."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

COUNTY COMMISSIONERS

By _____ Chairman



Commonwealth of Massachusetts
County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William J. Stapleton
Chairman

Ralph P. Walsh
~~XXXXXXXXXX~~
Stephen A. Moynahan

October 22, 1969

Mr. Leonard M. Meurisse
Stafford Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located at Smith Pond on Stafford Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The dike at the northerly end of the pond is in fair condition. The old stone masonry wall on the downstream side of the dike is in poor shape but serviceable. The central portion of the wall, washed out in the flood of 1955, has never been replaced. However, its absence does not endanger the structure. The toe area of the dike is wet but no water movement of any consequence was noted. The upstream concrete masonry wall of the dike at the old drawdown intake is satisfactory.

The sod cover on top of the dike area is fairly thick and suitable.

The earth embankment at the main dam should be cleared of all brush and tree growth. The embankment should be properly maintained and a good growth of turf developed over its entire surface.

The spillway is in fair condition. The concreted stone masonry crest is beginning to wear and erode. Loss of a portion of this crest will actually increase the spillway capacity and thus improve safety of the dam. No flashboards were on the masonry crest and water surface of the pond was a crest elevation.

The toe area in the brook just below the spillway is satisfactory. There is erosion occurring to the left of the spillway just downstream of the left abutment. This eroded area is in about the same condition as reported previously.

The owner should place heavy stone riprap in the void to prevent extension of the erosion.

It is recommended that the owner be directed to properly maintain the dam embankment and spillway.

In the opinion of the undersigned, the dam will continue to deteriorate and become unsafe, unless the recommended maintenance is accomplished in the near future."

Conditions at the dam are deteriorating to a point where it is essential that maintenance and repair be done if the dam is to remain active. The recommendations of the County Hydraulic Engineer must be followed. The earth embankment is to be cleared of all brush and tree growth. A good turf cover is to be developed on the embankment. The eroded area on the left side of the stream bank just below the dam, should be filled with heavy stone riprap to prevent further extension of this erosion during heavy rates of storm water overflow.

The recommended repairs should be accomplished by June 30, 1970. A reinspection of the dam will be made at or about that time. It will be expected that the recommended maintenance and repair work will have been completed.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Smith Dam aka Smith Pond Dam



1926 Monson

Dam located on Smith Pond off of Stafford Road. Also see: Moulton, W C, Dam aka Smith Pond Dam.

| | |
|---------|---------------------|
| Dam | Smith Dam |
| Dam | Smith Pond Dam |
| Name | Maurisse, Paul |
| Name | Smith, Walter G |
| Name | Maurisse, Leonard M |
| Name | Moulton, William C |
| Streets | Stafford Road |

November 14, 1951

W. G. Smith
Stafford Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam, located on Smith Pond at a point easterly of Stafford Road in Monson, has been recently inspected by our Engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Adjacent to the spillway section of the dam at the northerly abutment, burrow holes were noted in the embankment. Earthfill behind the south abutment is low. The burrow holes should be investigated and filled and earthfill brought to grade behind the south abutment."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

*Smith Pond Dam
Monson*

WALTER G. SMITH

STAFFORD ROAD
MONSON, MASSACHUSETTS

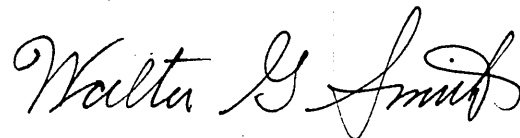
December 13, 1951

Hampden County Commissioners
37 Elm St.,
Springfield, Mass.

Gentlemen:

In regard to your letter dated November 14th last, I have repaired the dam mentioned on the North side as requested and as the South side is not my property I do not feel that it is my duty to make the repairs there.

Very truly yours,

A handwritten signature in cursive script that reads "Walter G. Smith". The signature is written in dark ink and is positioned below the typed name "Walter G. Smith".

Copy of this letter sent to George H. McDonnell,
County Hydraulic Engineer, on December 14, 1951.

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING

TIGHE & BOND
CONSULTING ENGINEERS
189 HIGH STREET
HOLYOKE, MASSACHUSETTS
TEL. 5525

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

January 8, 1952

The Hon. The Board of County Commissioners
Hampden County Court House
Springfield, Mass.

Attn: William F. Stapleton, Chairman


Gentlemen:

In reference to the letter received by your Board from Walter G. Smith of Stafford Road in Monson in which Mr. Smith states, "I have repaired the dam mentioned on the north side as requested and as the south side is not my property I do not feel that it is my duty to make the repairs there".

The undersigned has learned from Mr. Smith that the south side of Smith Pond and dam is now owned by a Mr. Paul Meurisse of Stafford Road, Monson.

Assuming that this information is correct, it is recommended that Mr. Meurisse be notified of the need for filling the earthfill to proper grade behind the south abutment of the dam as outlined in paragraph D of the report dated November 12, 1951.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer.

January 9, 1952

Mr. Paul Mourisse
Stafford Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45 et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the portion of the dam at Smith Pond located off Stafford Road in Monson and owned by you, has been recently inspected by our engineer, and your attention is called to the following conditions noted and recommendations made by him:

"Earthfill behind the south abutment is low. The earthfill should be brought to grade behind the south abutment."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
37 Elm Street

William F. Stapleton
Chairman

Thomas F. Sullivan
Ralph P. Walsh

Dec. 19, 1956

Mr. W. G. Smith
Stafford Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253 of the General Laws of the Commonwealth of Massachusetts relative to the inspection, condition and safety of dams, you are hereby advised that your dam located on Smith Pond at a point easterly of Stafford Road in Monson has recently been inspected by our Engineer. Your attention is called to the following conditions noted and recommendations made by him:

"A small washout has occurred at the northerly end of the pond near the emergency overflow. This washout has not been repaired. It should be filled with rock and earth, well packed. The work of repairing this washout should be done in the near future and completed in advance of spring heavy runoff conditions."

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

William F. Stapleton
Thomas F. Sullivan
Ralph P. Walsh

GHM/f

The above mentioned washout is on the property of William C. Moulton whose address is Calmer Road, Monson, Mass.

Walter G. Smith

WATER SUPPLY
SEWERAGE
SEWAGE DISPOSAL
STRUCTURAL ENGINEERING
ELECTRICAL ENGINEERING

TIGHE & BOND, Inc.
CONSULTING ENGINEERS
BOWERS AND PEQUOT STREETS
HOLYOKE, MASSACHUSETTS
TEL. JEFFERSON 3-3991

GEORGE H. McDONNELL
PHILIP W. SHERIDAN

DAMS & POWER INSTALLATIONS
HIGHWAYS & BRIDGES
HOUSING DEVELOPMENT
WASTE DISPOSAL

Dec. 31, 1956
C.D. Monson


The Hon. the Board of County Commissioners
Hampden County Court House
37 Elm Street
Springfield, Mass.

Gentlemen:

I have received the letter dated Dec. 19, 1956, from Mr. W. G. Smith of Stafford Rd. in Monson regarding the necessary repairs to a washout at the northerly end of Smith Pond in Monson. I note at the bottom of the letter that Mr. Smith has mentioned that the washout is on the property of Wm. C. Moulton whose address is Palmer Rd., Monson, Mass.

Apparently, the main dam on Smith Pond and the main portion of the pond itself is the property of Mr. W. G. Smith. However, the northerly end of the pond would appear to be on property of Wm. C. Moulton. Consequently, I suggest that the enclosed letter be sent to Mr. Moulton notifying him of the condition at the northerly end of Smith Pond.

Very truly yours,


George H. McDonnell
County Hydraulic Engineer

GHM/f

Jan. 2, 1957

Mr. Wm. C. Moulton
Palmer Rd.
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253 of the General Laws of the Commonwealth of Massachusetts relative to the inspection, condition, and safety of dams in Hampden County, you are hereby advised that at Smith Pond in Monson at a point near the northerly end of Smith Pond, a washout has been noted during routine inspection of the dam at Smith Pond. It is the understanding of this Board that the location of the washout is on your property. Your attention is called to the following condition noted and recommendations made by the County Hydraulic Engineer.

"A small washout has occurred at the northerly end of the pond near the emergency overflow. This washout has not been repaired. It should be filled with rock and earth, well packed. The work of repairing this washout should be done in the near future and completed in advance of spring heavy runoff conditions."

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Oct. 22, 1958

Mr. Paul Meurisse
Stafford Road
Monson, Mass.

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of the dams of Hampden County, you are hereby advised that the dam forming Smith Pond in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"Brush and trees growing at the right abutment should be cut down. It would be advisable to make repairs at the north end of the pond where earth has been washed out in the vicinity of the drawdown pipes. Repairs could easily be made by filling this wash out with riprap or by constructing a concrete retaining wall and then filling behind the wall with earth."

According to our records, the south side of this dam is on your property while the north side of the dam is on property of Walter G. Smith. That portion of the County Engineer's report in regard to your portion of the dam refers to needed work at the right abutment. Other matters referred herein are apparently on property of Moulton.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

Oct. 5, 1960

Mr. W. G. Smith
Stafford Road
Monson, Mass.

Dear Sir:

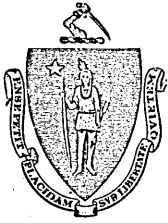
In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to inspection, condition and safety of the dams of Hampden County, you are hereby advised that your dam located adjacent to your property at Smith Pond has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The embankment of this dam is in satisfactory condition. Brush should be cut from both sides of the spillway and the area kept relatively clear of vegetation so that the need for maintenance can readily be recognized and inspections of the abutment areas can be more thorough and complete. It was noted that some masonry has been broken from the crest of the spillway at about the center of the structure. This condition is not serious but it should be repaired if further erosion of the masonry is to be prevented. This condition does not decrease the safety of the dam. Repairs now will be less costly than those needed at a later date, if erosion is allowed to continue."

Any further information concerning these matters which you may desire will be furnished by this office upon request.

Very truly yours

BOARD OF COUNTY COMMISSIONERS



Commonwealth of Massachusetts

County of Hampden

Springfield, Mass.

Office of the
County Commissioners
52 State Street

William F. Stapleton
Chairman

Ralph P. Walsh
~~XXXXXX~~
Stephen A. Moynahan

October 22, 1969

Mr. Leonard M. Meurisse
Stafford Road
Monson, Massachusetts

Dear Sir:

In accordance with the provisions of Chapter 253, Section 45, et seq. of the General Laws, Tercentenary Edition, relative to the inspection, condition and safety of dams of Hampden County, you are hereby advised that your dam located at Smith Pond on Stafford Road in Monson has been recently inspected by our Engineer and your attention is called to the following conditions noted and recommendations made by him.

"The dike at the northerly end of the pond is in fair condition. The old stone masonry wall on the downstream side of the dike is in poor shape but serviceable. The central portion of the wall, washed out in the flood of 1955, has never been replaced. However, its absence does not endanger the structure. The toe area of the dike is wet but no water movement of any consequence was noted. The upstream concrete masonry wall of the dike at the old drawdown intake is satisfactory.

The sod cover on top of the dike area is fairly thick and suitable.

The earth embankment at the main dam should be cleared of all brush and tree growth. The embankment should be properly maintained and a good growth of turf developed over its entire surface.

The spillway is in fair condition. The concreted stone masonry crest is beginning to wear and erode. Loss of a portion of this crest will actually increase the spillway capacity and thus improve safety of the dam. No flashboards were on the masonry crest and water surface of the pond was a crest elevation.

The toe area in the brook just below the spillway is satisfactory. There is erosion occurring to the left of the spillway just downstream of the left abutment. This eroded area is in about the same condition as reported previously.

The owner should place heavy stone riprap in the void to prevent extension of the erosion.

It is recommended that the owner be directed to properly maintain the dam embankment and spillway.

In the opinion of the undersigned, the dam will continue to deteriorate and become unsafe, unless the recommended maintenance is accomplished in the near future."

Conditions at the dam are deteriorating to a point where it is essential that maintenance and repair be done if the dam is to remain active. The recommendations of the County Hydraulic Engineer must be followed. The earth embankment is to be cleared of all brush and tree growth. A good turf cover is to be developed on the embankment. The eroded area on the left side of the stream bank just below the dam, should be filled with heavy stone riprap to prevent further extension of this erosion during heavy rates of storm water overflow.

The recommended repairs should be accomplished by June 30, 1970. A reinspection of the dam will be made at or about that time. It will be expected that the recommended maintenance and repair work will have been completed.

Any further information concerning this matter which you may desire, will be furnished by this office upon request.

Very truly yours,

BOARD OF COUNTY COMMISSIONERS

BY: _____

Elliot Dam



1951 Monson

Dam located off Hampden Lower Road.

| | |
|-----------|--------------------|
| City/Town | Monson |
| Dam | Elliot Dam |
| Name | Elliot, W R |
| Streets | Hampden Lower Road |

November 14, 1951

W. R. Elliot
Hampden Lower Road
Monson, Mass.

Dear Sir:

You are hereby advised that our Engineer noticed the construction or enlargement of a dam at the rear of your property at the above address. As the dam exists today it is too small to come within County jurisdiction, however, if it is enlarged to a total height of ten feet, or the pond increased to a million gallons or more, the structure will come under the requirements of Chapter 253, Section 44 thru 50 of the General Laws. You would then be required to request permission to construct the structure, and it would be necessary for you to file plans and specifications with this office and to obtain approval of the plans and specifications.

Any information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman

W. R. Elliot

Monson

White Pool Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|----------------|
| City/Town | Monson |
| Dam | White Pool Dam |

MONSON
D13059

WHITE POOL DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Briand Dam



1933 Monson

Dam located on a small tributary of the Quaboag River.

| | |
|-----------|-------------------|
| City/Town | Monson |
| Dam | Briand Dam |
| Name | Briand, Wilfred J |
| Water | Quaboag River |

April 26, 1933

Mr. Wilfred J. Briand,
511 Springfield Street,
Chicopee, Mass.

Dear Sir:

In accordance with the provisions of Section 45 of Chapter 253 of the General Laws as amended by Chapter 334 of the Acts of 1923 and as further amended by Chapter 178 of the Acts of 1924 relative to the inspection, condition and safety of the dams of Hampden County, you are notified that your dam, located on a small tributary of the Quaboag River in the Town of Monson, has been inspected by our engineer and your attention is called to the following conditions noted and recommendations made by him;

"A portion of the south end of this dam is washed out for a length of about twenty feet. This washout was evidently caused by high water topping the dam. It is evident that if the pond is to be maintained, the embankment should be substantially overhauled and the spillway of the structure repaired and enlarged to prevent any further topping of the dam. If it is not intended to repair this dam, then the pond should be drawn down, and a substantial opening made through the dam for the free passage of the brook."

Now, therefore, in accordance with Section 46 of said Chapter 253, it is ordered that the above recommendations be complied with in a reasonable length of time.

Any further information concerning this matter which you may desire will be furnished by this office upon request.

Yours very truly,

COUNTY COMMISSIONERS

By _____
Chairman.

Zero Manufacturing Company Dam



o Monson

Also see: Dam Report Section - Monson.

| | |
|-----------|--------------------------------|
| City/Town | Monson |
| Dam | Zero Manufacturing Company Dam |
| Name | Zero Manufacturing Company |

MONSON
D13061

ZERO MANUFACTURING COMPANY DAM

NO IMAGE ON FILE FOR THIS RECORD

(INFORMATION EXISTS ONLY ON A FILE CARD FROM THE
OFFICE OF THE FORMER HAMPDEN COUNTY ENGINEER.)

Mill Brook Dam (Walinski Complaint)



1956 Monson

Concerns flood repair project on Chicopee Brook and Mill Brook when the Mill Brook Dam failed during the flood of August, 1955.

| | |
|-----------|--------------------------------|
| City/Town | Monson |
| Name | Grandview Construction Company |
| Name | Walinski, Boleslaw H |
| Water | Mill Brook |
| Water | Chicopee Brook |

Belmont Avenue,
Monson, Massachusetts

June 26, 1956

Mr. William F. Stapleton
County Commissioner
State Street,
Springfield, Massachusetts.

Dear Mr. Stapleton:

For quite some time I have been seeking an answer to my question, I am writing to you in the hope that you as County Commissioner can answer it or direct me to the proper agency that can answer this inquiry.

My problem stems from last year's August flood. There are two rivers crossing my land, one the Chicopee Brook and the other Mill Brook. Both of these rivers overflowed causing a great deal of damage to my farm. The Mill Brook dam broke. In order to return the stream to its original course the Grandview Construction Co. was sent in to clear the river bed. These men said they were sent by the State and the material left on either side of the brook would be cleared away at a later date. As of today the gravel and rock is residing where it was left.

The Selectmen tell me that they do not know when this matter will be taken care of or by whom it will be cleared. Will this be taken care of by the Town or State?

Thank you for your attention and help.

Yours truly,

Boleslaw Walinski
H.

(C O P Y)

Belmont Avenue,

Monson, Massachusetts

June 26, 1956

Mr. William F. Stapleton
County Commissioner
State Street,
Springfield, Massachusetts.

Dear Mr. Stapleton:

For quite some time I have been seeking an answer to my question, I am writing to you in the hope that you as County Commissioner can answer it or direct me to the proper agency that can answer this inquiry.

My problem stems from last year's August flood. There are two rivers crossing my land, one the Chicopee Brook and the other Mill Brook. Both of these rivers overflowed causing a great deal of damage to my farm. The Mill Brook dam broke. In order to return the stream to its original course the Grandview Construction Co. was sent in to clear the river bed. These men said they were sent by the State and the material left on either side of the brook would be cleared away at a later date. As of today the gravel and rock is residing where it was left.

The Selectmen tell me that they do not know when this matter will be taken care of or by whom it will be cleared. Will this be taken care of by the Town or State?

Thank you for your attention and help.

Yours truly,

Boleslaw Walinski
H.

(C O P Y)

June 26, 1956

Dear Bill,

The enclosed letter that I've written for my father contains the information you suggested I give you. If I've neglected any important data I'll be very happy to supply it.

Thank you for your advice and help.

Sincerely,
Kelen

Belmont Avenue
Monson, Massachusetts
June 26, 1956

Mr. William F. Stapleton
County Commissioner
State Street
Springfield, Massachusetts

Dear Mr. Stapleton:

For quite some time I have been seeking an answer to my question, I am writing to you in the hope that you as county commissioner can answer it or direct me to the proper agency that can answer this inquiry.

My problem stems from last year's August flood. There are two rivers crossing my land, one the Chicopee Brook and the other Mill Brook. Both of these rivers overflowed causing a great deal of damage to my farm. The Mill Brook dam broke. In order to return the stream to its original

course the Grandview Construction Co. was sent in to clear the river bed. These men said they were sent by the state and the material left on either side of the brook would be cleared away at a later date. As of today the gravel and rock is residing where it was left.

The selectmen tell me that they do not know when this matter will be taken care of or by whom it will be cleared. Will this be taken care of by the town or state?

Thank you for your attention and help.

Yours truly,
Boleslaw Halinski

July 19, 1956

Mr. F. W. Guerin,
State District Highway Engineer,
403 Belmont Street,
Worcester, Mass.

Dear Mr. Guerin:

I enclose copy of a letter from
a Mr. Walinski of Belmont Avenue, Monson, Massachu-
setts, concerning a flood repair or stream clearance
project in the Chicopee Brook and Mill Brook in Monson.

It is my thought that this project
carried on by the Grandview Construction Co., may have
been processed through your office and that you may be
able to initiate action that will result in the removal
of material deposited on the land of Mr. Walinski.

We will appreciate your looking
into this matter.

Very truly yours,

Chairman, Hampden County
Commissioners.

WFS/N
copy to
Boleslaw Walinski.



End of Book D13~ Dams ~ Town of Monson